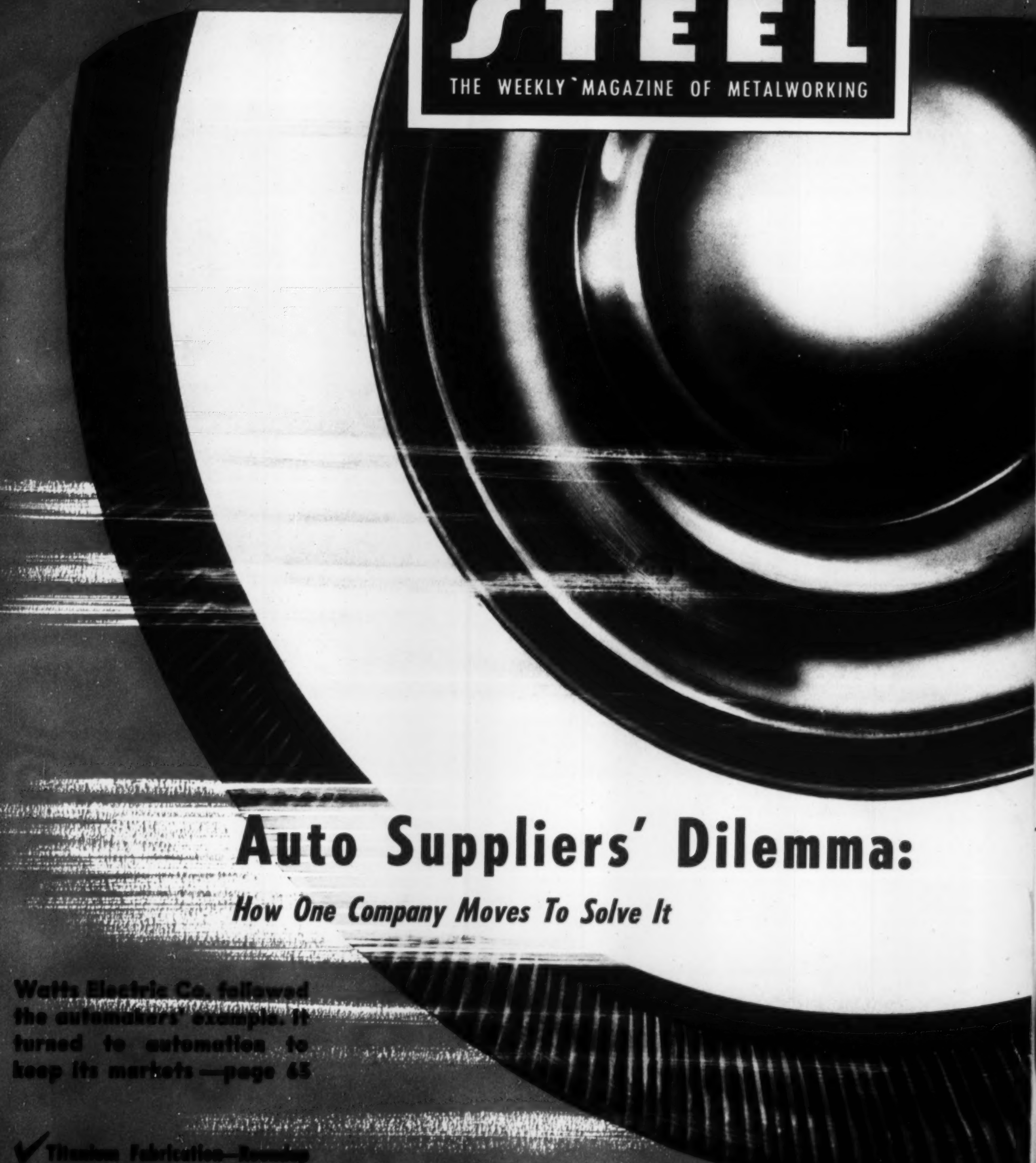
OCTOBER 4, 1954

STEEL
THE WEEKLY MAGAZINE OF METALWORKING



Auto Suppliers' Dilemma:

How One Company Moves To Solve It

Watts Electric Co. followed the automakers' example. It turned to automation to keep its markets —page 65

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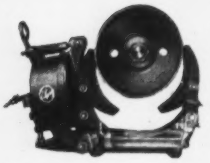
Complete CONTROL for CRANES by EC&M

SHORT-THROW Narrow-width Cam Master Switches are easy on the operator.



LONG - LIFE Brakes give high-speed performance — with low up-keep.

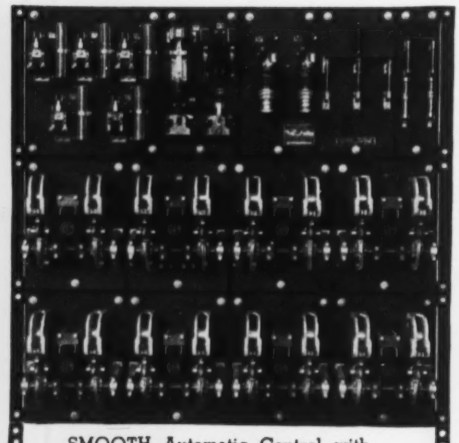
Users Know EC&M Equipment Gives Top Performance . . . Low Up-Keep

EC&M Crane Apparatus and Control Engineering have a reputation for eliminating initial delays and for permitting production to be maintained at a high level throughout the life of the investment.

EC&M Crane Equipment is specially engineered for *each* crane. EC&M has *always* built control from the crane data sheet. Relay-settings, resistor-fillings, brake-windings, etc., are matched to the actual crane-loading. Result is top performance right from the start.

Many crane users, when buying new cranes or revamping existing installations, specify EC&M Control. They know the extra margin of safety built into EC&M Equipment and the accurate engineering of the apparatus result in freedom from delays—smooth performance. Write EC&M into the specifications for your next crane.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79th STREET • CLEVELAND 4, OHIO



SMOOTH Automatic Control with EC&M Frequency Relay Magnetic Controllers.

When Buying Cranes... **Specify EC&M CONTROL**

He keeps his eye on the ball

Let's climb into one of the hot-mill pulpits at our Lackawanna sheet plant for a moment. Meet Buck, the speed operator at the controls to your right. He has just calculated the rolling-speed requirements for a run. He's setting up the speeds for the finishing train. From here on in, it'll be up to him to maintain proper tension on the sheet during every second while it whizzes through the mill.

"This continuous mill is as sweet a piece of machinery as you'll ever see," Buck will tell you with a prideful grin. "But you have to keep your eye on the ball, because the mill doesn't run by itself. It still takes a bunch of guys who really know their stuff to turn out good sheets.

"Here at Lackawanna we go all-out for 100 per cent quality sheets. That's another reason why it's my job to see that these mill stands keep turning at exactly the right speeds—and I mean *exactly!*"

Buck knows whereof he speaks. The speed relationships from stand to stand, and from operation to operation, have a great deal to do with determining the quality of the final product. For example, if one stand is running too fast in relation to the one that precedes it, the steel may be stretched into an hour-glass shape. Speeds must be *right* all along the line.

It takes good men to make top-quality sheets. Good men, and of course good equipment, and good steel. But in our sheet mills at Lackawanna and Sparrows Point you'll find something else, in addition: the will to produce the finest hot-rolled and cold-rolled sheets made anywhere.

That comes partly from the natural satisfaction that a man feels in doing good work, partly from healthy self-interest. For a good product means satisfied customers, and satisfied customers mean more orders to keep mills running and men at work.

Take a bunch of men imbued with that attitude, give them the best tools money can buy and the best steel we know how to make, and you'll get a good product, every time! That's why you can look to Bethlehem for sheets that, at the very least, will compare favorably with the best the industry is making. Sheets that are as finely finished, as easy forming, as true to gage, as any on the market. Sheets as fine as you can buy!

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM SHEETS

Seeing is Understanding

You'll see how the elimination of flanges and undercuts on the inner ring provides a *wider* contact area for the rollers.

This SKF Story
Of Spherical Bearing Design Improvement

When SKF first announced that its *improved* (Type "C") Spherical Roller Bearing provides, size for size, up to 50% more capacity and 2 to 3½ times longer life than any other available design, most people asked:

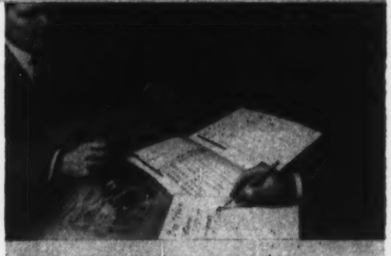
"How was this done?"

Your SKF District Office has the answer, in the form of a clear, quick *visual* demonstration. Ask to see it—here, in outline, is what you'll see!

You'll see how much longer the Type "C" Rollers are than those in the original SKF design.

You'll see the way the rollers are *guided* by a separate floating guide ring, free to move axially.

You'll see the improved brass *window-type* cage—see why it's stronger and more effective.



You can see an exact comparison of original vs. Type "C" capacity and life in the sizes of sphericals you use.

SKF

BALL AND ROLLER BEARINGS

SKF INDUSTRIES, INC.
PHILADELPHIA 32, PA.

YES—We'd like to have an SKF Representative SHOW us WHY the improved SKF Type "C" Spherical provides, size for size, more capacity and longer life than any available spherical design.

Name ....

Company ....

Address .... *State* ....

Mail this coupon NOW and SEE why you can get better spherical roller bearing performance. No obligation, of course.

SKF INDUSTRIES, INC., PHILA. 32, PA.—*manufacturers of* **SKF** *and* HESS-BRIGHT® *bearings.*

7538

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From the men
who design...
to the men
who use...

The handling ease of an ATLAS Sling means safe, fast, LOW-COST HANDLING

30,000-lb. propeller being handled with one 8-part ATLAS Braided Sling in figure 8 Choker-Hitch. Notice how the braided body hugs the contour of the load.

A sling designed to handle easily will handle loads faster. That's the reason why flexibility, lightness, and handling ease are part of the basic design of Macwhyte ATLAS Round-Braided Slings.

Here's how handling ease is built into the finished ATLAS Sling: all ropes in ATLAS Slings are braided in a continuous, spiral path. Ropes are endless—all ropes in the body are the same length and carry an equal share of the load. There are two pairs of Left Lay, and two pairs of Right Lay ropes—making a total of eight ropes in the equally balanced-braided body of the Sling.

Users can attach ATLAS Slings faster because of their "built-in" handling ease. And these Slings last longer because they do not snarl, kink, or curl up as easily as ordinary slings.

Many Macwhyte Slings of standard design in Round-Braided, Flat-Braided, Single-Part, and Grommet Slings are illustrated in the Macwhyte Sling Catalog. Special slings can be designed to meet individual requirements.

Macwhyte engineers will gladly recommend the proper sling for your material handling needs. Their recommendations can save you time, money, and labor.

Ask any Macwhyte distributor, or write direct to:

MACWHYTE COMPANY
2912 Fourteenth Ave., Kenosha, Wis.

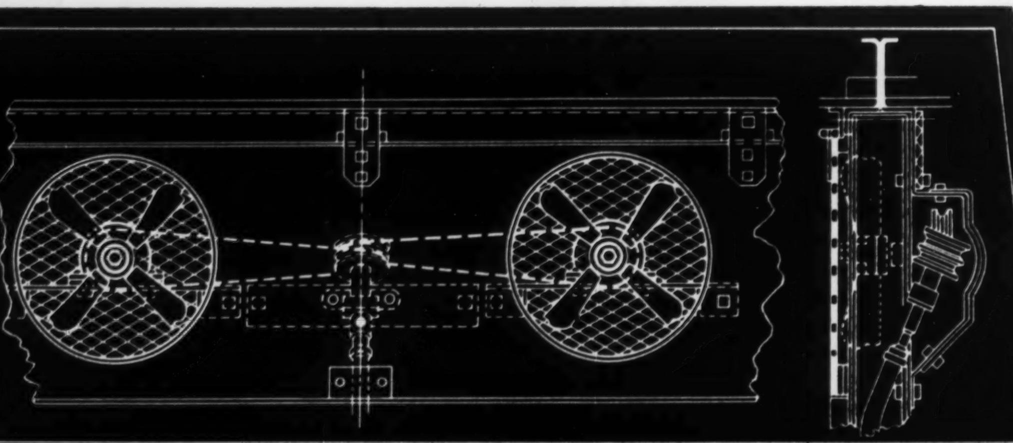
MACWHYTE
PREformed
WHYTE STRAND
WIRE ROPE

Send for Bulletin 5308 containing load rating tables, illustrations, and general information on slings.

MACWHYTE

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope, and Wire Rope Assemblies. Catalogs available on request.

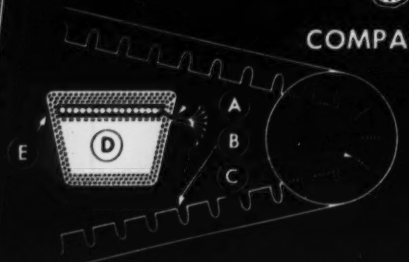
Mill Depots: New York • Pittsburgh • Chicago • St. Paul
Ft. Worth • Portland • Seattle • San Francisco • Los Angeles



GOODYEAR INDUSTRIAL PRODUCTS

GTM -Specified

COMPASS-V-STEEL BELT for Heavy-Duty V-Drives



- A. Load carrying section of endless high tensile steel cable
- B. Vents open between pulleys, dissipating heat
- C. Vents compress rounding pulleys, giving continuous gripping surface
- D. Highest quality rubber underbody
- E. Sturdy bias laid fabric cover resists wear

NO BREAKDOWN THROUGH BELT FAILURE

in 2 years on 6,000 drives

BLUEPRINTED above is the tough, quarter-twist drive on the air circulators of a refrigerated railroad car. Two such drives are located over the ice bunkers at the ends of the car. Their job is to equalize the temperature throughout the car by blowing cold air toward the center. They must be reliable, since any breakdown could mean costly damage to a perishable cargo.

To help them design the most dependable drive possible, a bunker maker called in the G.T.M. — Goodyear Technical Man — who recommended a change in sheaves and the use of COMPASS-V-STEEL Belts. Today, after over two years of across-the-country service, no breakdowns because of belt failures have been reported on 3,000 cars — 6,000 drives — 12,000 belts.

If you need a truly reliable V-belt for a drive involving heavy loads, shock loads, speeds of 10 to 10,000 feet, limited space or unusual heat, call in the G.T.M. or your Goodyear Distributor. Let him give you the full story on COMPASS-V-STEEL Belts — the stronger, more efficient belts that have proved themselves on over 5,000,000 critical drives. Or write Goodyear, Industrial Products Division, Akron 16, Ohio.

YOUR GOODYEAR DISTRIBUTOR *can quickly supply you with Hose, Flat Belts, V-Belts, Packing or Rolls. Look for him in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."*

Compass—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

GOODYEAR

THE GREATEST NAME IN RUBBER

We think you'll like "THE GREATEST STORY EVER TOLD"—every Sunday—ABC Radio Network—THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING
Vol. 135 No. 14 October 4, 1954

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CUT CLEANING COSTS-

METALWASH Spray Pickling Machine at PHILCO CORPORATION Connersville, Indiana, Plant

RIGHT DOWN THE LINE!

The **METALWASH** multi-stage Spray Pickling Machine illustrated above prepares refrigerator liners for porcelain enameling at the Philco Corporation's Connersville, Indiana, plant.

The **METALWASH** Continuous Spray Pickling Machine has become an indispensable *production method* in the preparation of steel for *porcelain enameling*, in the removal of mill scale prior to *plating, polishing, phosphatizing*, and in the removal of annealing scale following the *heat treatment of deep drawn* and *stamped parts.*

METALWASH Spray Pickling represents a basic improvement in the *nature of the pickling process:*

The removal of oxide scale is the result of a *mechanical* as well as a chemical action, and *it is the force of the acid from high-pressure sprays, blasting the conveyorized work from all angles, that produces the thorough, fast, uniform results obtainable only in a* **METALWASH** *Spray Pickling Machine.*

METALWASH PARTS WASHERS, designed for *alkaline-, neutral emulsion-,* or *solvent-type cleaners,*

METALWASH VAPOR DEGREASERS *provide new speed, economy, durability.*

METALWASH PHOSPHATIZING MACHINES *provide ideal surface for lasting paint finishes.*

METALWASH®
WASHING PICKLING DRYING PHOSPHATIZING DEGREASING

METALWASH MACHINERY CORPORATION
917 North Avenue, Elizabeth 4, N. J.
In Canada, Canefco, Ltd., Toronto, Ontario

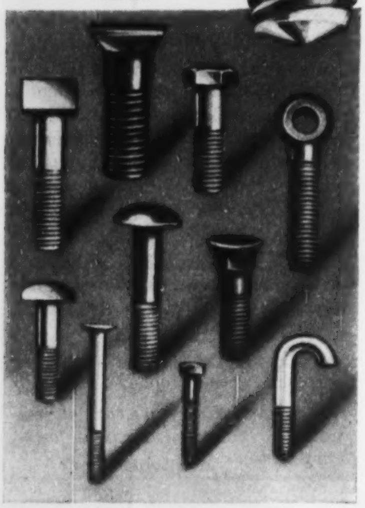
Threaded Specialties

lower cost
EYE BOLTS
by an
exclusive method

Among Pawtucket's many specialty products are these lower-cost eye bolts or "swing" bolts. Pawtucket's exclusive production method keeps cost low, dimensional accuracy unusually high and strength above standard.

Pawtucket eye bolts are made in standard sizes ¼" and larger, or to your specifications. In any size, you can depend on uniform Class 3 fit, if required.

All standard steels, stainless steels and non-ferrous metals, including Titanium



BETTER BOLTS SINCE 1882

PAWTUCKET
MANUFACTURING COMPANY
327 Pine St. • Pawtucket, R. I.
THE PLACE TO SOLVE YOUR BOLT PROBLEMS
T.M. REG.
"The Bolt Man"

behind the scenes

Knight of The Blue Pencil

Most editors and scholars agree that writing was introduced to the Western nations by the Phoenicians, and after that there wasn't much change in this basic concept of setting forth information until Gertrude Stein saw some saw some saw some pigeons pigeons on the grass alas! Miss Stein was an American writer of considerable note who specialized in double-talk, possibly in the belief that if you skipped a sentence it wouldn't make much difference, because if you kept on reading you would soon catch up with yourself.

Recently, Managing Editor Walt Campbell found himself in communion with Miss Stein; he felt that writing could be improved. Whereas, however, the redundant Gertie drove her stuttering typewriter primarily to pleasure the long-haired literary set, Walt concerned himself with 138,000 readers of STEEL. The metalworking executive who reads STEEL is a very busy man; his time is limited, and his reading is selective. Improved writing would enable him to get more information in the time he spends reading.

So, Editor Campbell created a Copy Desk, and placed it under the direction of Associate Editor Harry Chandler, who now functions as Copy Editor. Harry's job is to read all editorial copy and check to see that it, (a) presents the most possible information in the least possible reading time; (b) is easy and attractive reading, and (c) becomes increasingly consistent in style. That's a major assignment for anybody, so let us tell you something about our Copy Editor.

Aside from having earned his Master's degree in journalism, he is also a member of the Indiana Bar - - - - so you see, beyond knowing his stuff, he is also qualified to argue about it. That should make it rough on any dissenters. However, Harry is the soul of courtesy and patience, qualities which he may have acquired on a South Sea island when he was a captain in the U. S. Marine Corps - - - -or later, perhaps, when he was obliged to keep explaining that the Armour he worked for in Chicago was NOT the meat-man: it was the Armour Research Foundation of Illinois Institute of Technology.

When Harry examines the copy that floods across his desk he will represent the reader, and help protect him from excess wordage, redundancy, obscurity and stuff like that there. The new Copy Editor will not concern himself with such piddling things as split infinitives and terminal prepositions. Responsible for the readability of all editorial copy that goes into STEEL, he will have the right to make decisions - - - - and even the privilege of making mistakes!

Stewed Feathers—Yummy!

George Auner, STEEL's statistician, who never walks when he can run, sends along a copy of "The Indian Exporter & Trader" with no comment except a large question mark scrawled over an ad purchased by "The Entrepreneur", who operates from P. O. Box 9017, Calcutta. The entrepreneur advises that he is prepared to export, among other items, "Edible Feathers, Hides, Skines & Leather & Leaving Animals & Birds."

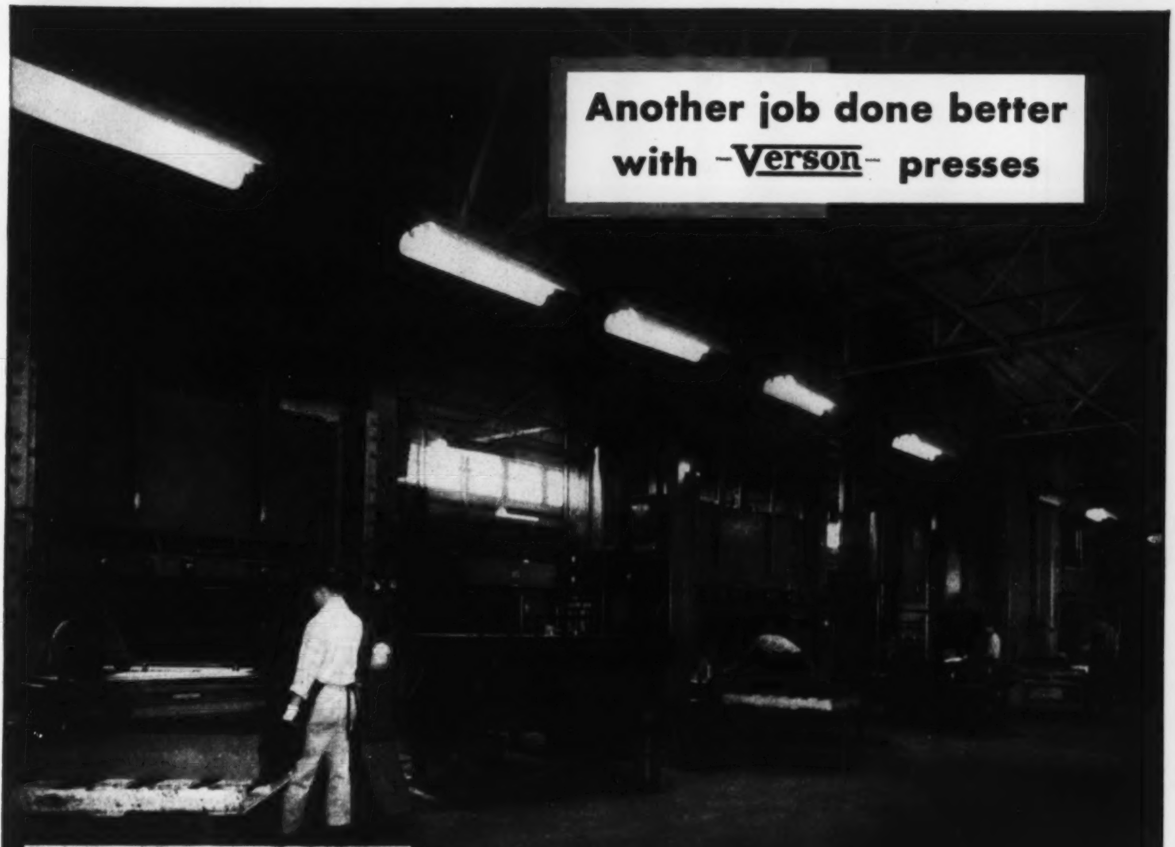
There might be nourishment in feathers; you might be real corny, and say they would do for a light lunch, but that is not what worries us. How about those Hides and Skines? We trust they have not been taken from Leaving Animals & Birds, because the Anti-vivisectionists would raise the very devil if they got wind of it.

What's Up, Doc?

Dr. Allen Gray, Technical Editor, may be looking for a new baby-sitter. He overheard her describing him to another teen-ager. "Oh, no, Dr. Gray isn't like that; he's supposed to be a doctor, I guess, but not the kind of a doctor who does anybody any good."

Shrdlu

(Metalworking Outlook—Page 43)



Another job done better with -Verson- presses

Above is a close-up of compressor mounting plates as they come from one of the large Verson mechanical presses at Amana.

Amana's New Facilities Feature this -Verson- Line-up

Prominent in the expanded stamping facilities of Amana Refrigeration, Inc., is the line-up of big Verson presses shown above. Among the biggest in use at Amana, they include four 350 ton full eccentric mechanical presses and a 600 ton hydraulic press. In addition Amana also uses one of Verson's smallest presses, a 150 ton open back inclinable.

Like progressive manufacturers of metal products everywhere, Amana has taken advantage of Verson's press building know-how to assure themselves of quality, efficiency and economy in the production of metal stampings.

The Verson line is complete, comprising virtually all types of presses and tooling. If you make anything requiring metal stampings, it will pay you to consider Verson.

Basic data on the entire Verson line is presented in Catalog G-53. Write for your copy, today. It may be the first step towards more efficient production of stampings.

A Verson Press for every job from 60 tons up.

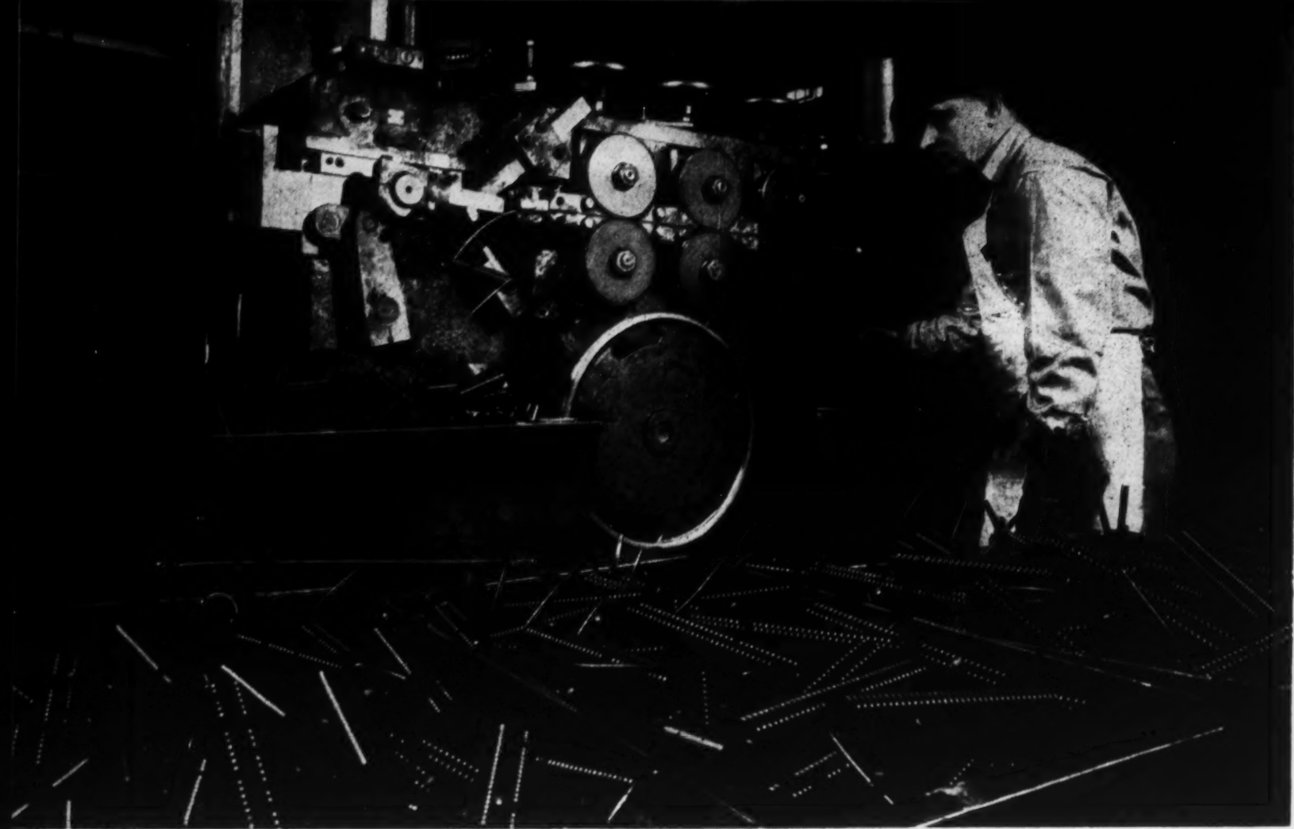
TRADE **-Verson-** MARK

ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

VERSON ALLSTEEL PRESS CO.

9318 S. KENWOOD AVENUE, CHICAGO 19, ILLINOIS • SO. LAMAR AT LEDBETTER DRIVE, DALLAS, TEXAS

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING • DIE CUSHIONS • VERSON-WHEELON HYDRAULIC PRESSES



At L. A. Young Spring & Wire Corporation, Detroit, it takes a combination of quality steel wire; modern, high speed machines; and skilled men to produce high quality steel springs like these automobile hood hinge springs.

How Pittsburgh Steel Helps L. A. Young Produce High Quality Steel Springs At Machine-Gun Speed

Take 10 feet of .216 inch diameter oil tempered spring wire, form it into a spring 10.5 inches long by coiling it 35 times, extend that spring 14.5 inches and you have a machine capable of exerting a pull of 400 pounds. In other words springs, like the auto hood hinge springs shown in photo above, are machines.

Anyone who produces these identical springs by the thousands in an eight-hour turn on one machine must realize the importance of having the finest quality steel wire, the most modern high speed machines, and

Brake Silencer Springs to dampen auto brake drum vibration are fabricated on this Sleeper-Hartley spring coiler. Each spring contains 34.5 feet of .092-inch diameter hard drawn MB spring wire in 380 coils. After fabrication, the spring is 34⅝ inches long.

Cushion Springs for automobile seats are made from Pittsburgh hard drawn MB spring wire. On this Van Orman coiler and knotter, one of a battery at L. A. Young, 6-coil springs 5½ inches in length, are produced by the thousands.

Your Roast Beef, home-made pies and cakes are supported in your kitchen range on wire racks like these fabricated from Pittsburgh bright basic wire, nickel-plated for resistance to heat and rust. Here, rack frames are fabricated on an automatic resistance welding line.

(Advertisement)

For Your Auto Riding Comfort zig-zag springs like these are made from Pittsburgh hard drawn MB spring wire on high speed machines. A 41-inch spring contains 51 loops. Produced to an arc with a 13½-inch radius, the arc provides the spring in your seat cushions.

A Spring, the master cylinder of your brake system, releases the pressure when you release your brake. To stand up under this repeated usage, these master springs are made of high quality .067-inch diameter tinned music wire. Into one spring goes 22 inches of wire.

good production men all along the line.

● **Where It Comes From**—Pittsburgh Steel Company, one of the country's leading producers of wire for industry, is an important supplier of wire to L. A. Young Spring & Wire Corporation, because Pittsburgh wire can be depended on to meet or better Young's specifications for grade, size, temper, hardness, and above all, absolute uniformity coil end to coil end and coil to coil. The slightest variation from absolute uniformity in the wire feeding into an automatic coiler at machine-gun speed can cause a misfire that jams the works, reduces productivity, increases costs, reduces profits.

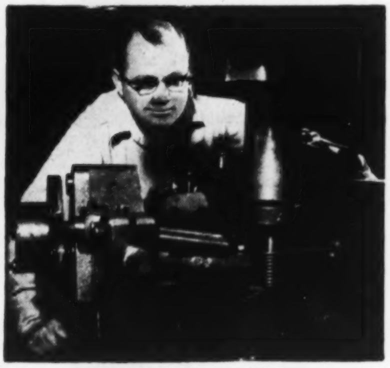
Pittsburgh Steel Company has been a wire producer for over 50 years. The long experience at steel making of their mill men and metallurgists, from the blast furnaces and open hearths through final wire drawing and finishing operations, goes into every pound of wire that is made.

On Pittsburgh Steel wire mills at Monessen, Pa., some of the most modern in the industry, are produced such grades as bright basic; low, medium and high carbon; all types of annealed wire; ACRS core wire; cold-heading wire; oil-tempered spring wire; hard drawn MB spring wire; and shaped wire.

● **Supplementary Line**—The wire mills of the subsidiary Johnson Steel & Wire Company at Worcester, Mass., producers of fine wire specialties, have just completed a thorough-going modernization. Their range includes armature binding wire; wire for brushes; metal stitching, hose reinforcement; stapling wire; bobby pin wire; tire bead wire; rope wire; oil-tempered and MB hard drawn spring wire; music spring wire right down to sizes as fine as a human hair.

The combined operations of these plants offer the wire user an unusually broad diversity of high quality wire to select from, assure him fast service to meet a wide variety of applications. Pittsburgh Steel's operations are geared to mesh smoothly with the customer's production-line requirements. Oil-tempered spring wire, for example, is stocked at Monessen for immediate shipment.

If, like L. A. Young, you use steel wire in your manufacturing operations, why not talk to a man from Pittsburgh Steel? You will find him at one of the company's district offices near you, or at the home office. A phone call or a letter will bring prompt action. He will be glad to show how you can get the full benefits of Pittsburgh Steel's ability to make the kind of wire you want and deliver it when, how, and where you want it.



Take Your Foot from the brake pedal and rugged, dependable, springs like these return the brake shoes to the "ready" position. To make this type of spring, 37 inches of .200 inch diameter Pittsburgh oil-tempered spring wire are formed into a 9¾ coil 3⁵⁄₁₂ inches long.

"Everything New But The Name"

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES: Atlanta • Chicago • Cleveland Columbus • Dallas • Dayton • Detroit • Houston • Los Angeles New York • Philadelphia • Pittsburgh • San Francisco • Tulsa Warren, Ohio. **PLANTS:** Monessen, Pa. • Allenport, Pa. • Akron Los Angeles • Unionville, Conn. • Warren, Ohio • Worcester, Mass.

PRINCIPAL PRODUCTS: Hot and Cold Rolled Strip and Sheets • Strip Specialties • Seamless Tubular Products • Wire and Wire Products • Chain-Link Fence • Cargotainers • Steeltex

(Advertisement)

FIRE!

Put it out in seconds with a Kidde portable extinguisher!

When fire strikes, there's just one thing to do – Put it out *fast!* That's why it's so vital to have Kidde portable extinguishers near every fire hazard . . . because Kidde portables, with their special fast-acting trigger release, are made to swing into action at a moment's notice.

You just grab a Kidde CO_2 or Dry Chemical portable, aim the horn, and pull the trigger. Whoof! The fire's smothered right in its tracks!

And don't forget big hazards like spray booths, dip tanks, electrical equipment and flammable liquids. See that they get the built-in protection of a Kidde *Fully Automatic* CO_2 Fire Extinguishing *System.*

Don't wait – Contact Kidde today!

Kidde

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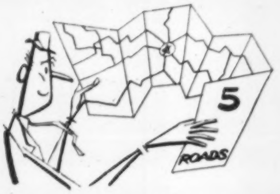
Walter Kidde & Company of Canada, Ltd., Montreal — Toronto

LETTERS
TO THE EDITORS

Roadmap of Diversification



Congratulations on your thought-provoking article, "Product Diversification: Five Roads to Greater Profit" (Sept. 13, p. 113); Number 8 in STEEL's 1954 Program for Management. This will be an important contribution to the sparse literature on this subject.

I will be speaking soon to the New England Council at Bretton Woods on this subject and intend to mention your excellent article. On Apr. 12, I also will be in Cleveland with the Controllers Institute talking on this same general subject of how a company grows.

W. E. Hill
W. E. Hill Co.
New York

. . . I feel that this is an excellent presentation, and that you are to be congratulated in organizing it so well.

Dr. Nelles, the director of our laboratory, also felt that it was an extremely good presentation, and we are wondering whether it is possible to receive a half-dozen tear sheets.

C. R. Freberg
assistant director
Borg-Warner Research Laboratory
Bellwood, Ill.

. . . I would greatly appreciate receiving a tear sheet of "Product Diversification: Five Roads to Greater Profit" . . .

Carl W. Coslow
vice president—manufacturing
Plomb Tool Co.
Los Angeles

. . . please send 12 copies.

E. Girolamo
W. L. Maxson Corp.
New York

. . . please send ten tear sheets.

M. Barthel
Stewart-Warner Corp.
Chicago

. . . please send me six tear sheets.

E. N. Case
Metal Chemicals Section
Industrial Chemicals Division
American Cyanamid Co.
New York

. . . please send six more tear sheets.

W. K. Weatherly
Pressed Steel Car Co. Inc.
Chicago

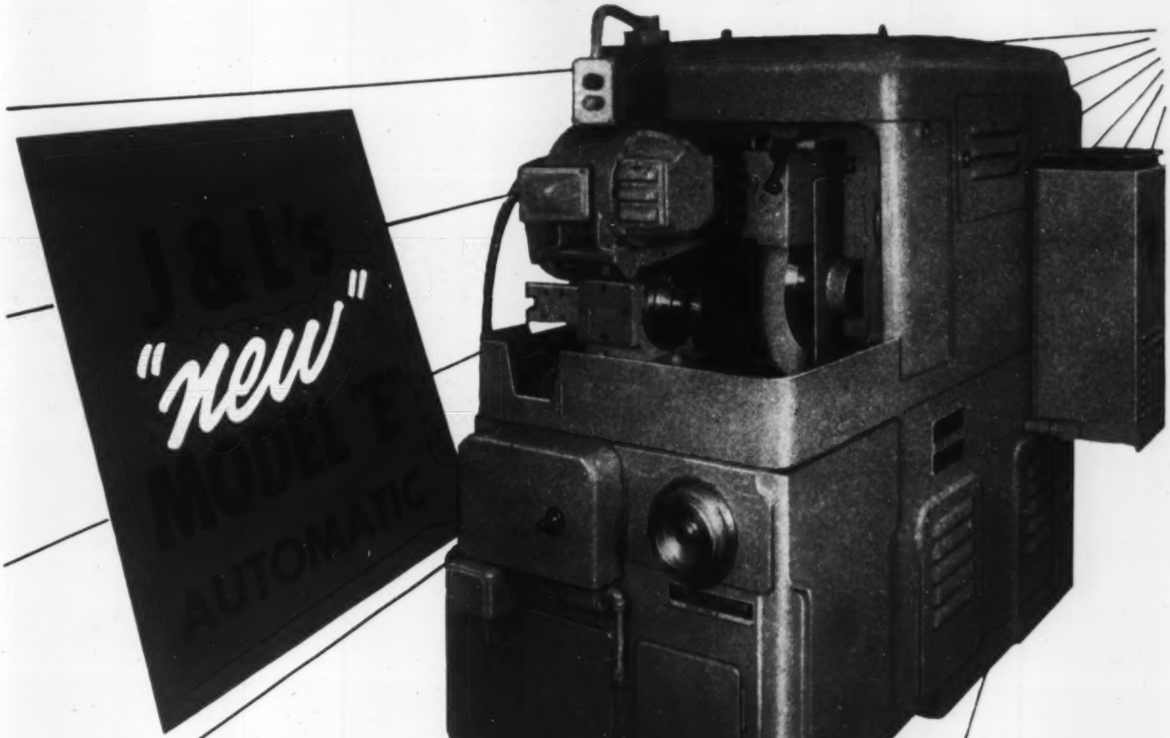
. . . please send 50 tear sheets.

R. L. Whaley
Commerce department
Cleveland

(Please turn to page 12)

An Outstanding Advance

in PLUNGE FORM GRINDING



Sets New Records for Production and Accuracy . . . Reduces Costs . . . Replaces Other Methods for Producing a Great Variety of Work! Note These Advanced, In-Built Features!

- **Completely automatic cycle** — High speed approach, wheel feed spark out and withdrawal are positively controlled through simple cam action — ensuring constant, uniform operation under all conditions.
- **Automatic positive size control** — The wheel slide is held against positive stops with uniform hydraulic pressure.
- **Automatic trueing device** with controlled dressing.
- **Automatic or manual handling.**
- **Complete versatility** — chucking work, center work or shoe-type grinding; crush wheel or diamond trueing.
- **Compact design** — affords exceptional accessibility and simple set-ups.

P.S. →

JONES & LAMSON MODEL "E"

Write for illustrated folder — gives complete specifications and examples of how the Model "E" does jobs faster, better and more economically.

JONES & LAMSON

Machine Tool Craftsmen
Since 1835

JONES & LAMSON MACHINE CO., 517 Clinton St., Dept. 710, Springfield, Vt., U.S.A. J&L® MACHINE TOOL DIV.

(Advertisement)

plant-location news

How to get facts on raw materials

Just what do you need to know about raw materials before you pick a new plant site? Where to get aluminum castings in a hurry? How much it will cost to deliver 200 tons of Connellsville coal daily to your doorstep? Are synthetic yarn suppliers near at hand? Where can you find large and available quantities of high calcium limestone? Can you expect a continuing local supply of veneer logs? Storage and terminal facilities for handling bulk items? A chemical analysis? A cost schedule?

Whatever you need to know about a material—whether it's of local origin or comes from New Zealand, whether it's still in the earth or a semi-processed state—New York State's Industrial Location Service will give you the answers fast. And there's no cost or obligation.

I don't think there's any industry we can't serve. No matter what your special problems, we'll tell you where to locate needed materials and supplies. Because most of our clients are sticklers for perfection, we are, too. We'll describe the quality and quantity of raw materials, and give the total cost for delivery to any destination you say.

The full story in two weeks

Recently a manufacturer of glass bodies for electronic tubes wrote us for information on the materials vital to his operation—glass sand and natural gas. Our ILS staff set to work as they always do. They studied geological maps, analyzed samples, tabulated supply data, sent out information requests to district ILS offices, and consulted experts in the field. Within two weeks the manufacturer had a complete, concise report on his desk covering several desirable industrial locations.

Quick and easy to read

He didn't have to wade through complicated charts, graphs, and heavy-going paragraphs. The report was current, concise, and it was complete.

He didn't have to follow up footnoted references, or check so-and-so's special report on the sands of Upper Hollow. With the data furnished in our report, he could pick up the best possible plant location with unerring accuracy.

Other free plant-site services

Raw materials won't be your only concern when you're looking for a new plant location. But no matter what factors are involved, ILS can be of help. Free reports are available on transportation, markets, water, labor, buildings and sites, and local laws and regulations—to mention just a few.

Our booklet called "Industrial Location Services" shows how you can put this valuable plant-location data to work. To get your copy, just write me at the New York State Department of Commerce, Room 880, 112 State Street, Albany 7, N. Y.

Ronald B. Peterson

Director Industrial Location Service

LETTERS

(Concluded from page 10)

Sold on Selling Story

Your article, "How To Reduce Selling Costs Without Scuttling Your Sales Program" (Aug. 16, p. 65), seems to be of such value that we would like two additional copies.

Richard V. Bentley
purchasing agent
Aero-Coupling Corp.
Burbank, Calif.

We are interested in obtaining another copy of "How To Reduce Selling Costs Without Scuttling Your Sales Program."

K. P. Wesseling
K. P. Wesseling & Co. Inc.
St. Louis

- *Sent.—ED.*

Seeking More Suppliers

This company is in the process of expanding its source of supply listings of certain materials. One major type of suppliers falling into this category is forgings and castings suppliers who also have the necessary equipment to machine the rough casting into the finished part required.

Can you help us locate forging and casting suppliers who also have complete machine shop facilities?

Walter H. Barks
assistant director of purchases
Wright Aeronautical Division
Curtiss-Wright Corp.
Wood-Ridge, N. J.

- *We believe your best source of such information would be the trade associations in the forging and casting industry. Those are: Drop Forging Association, Cleveland; Gray Iron Founders Society, Cleveland; Malleable Founders Society, Cleveland; and Steel Founders Society of America, Cleveland.—ED.*

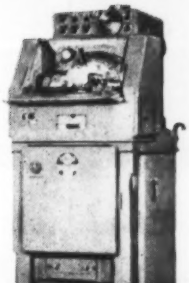
Oversight Not Poor Sight

In the Sept. 20 issue of STEEL, there is an excellent article, "Unique Design for Welded Gantry Crane" (p. 131). I take it that the fact that there is no credit line is due to an oversight. Or perhaps the credit is concealed somewhere and my eyesight is failing.

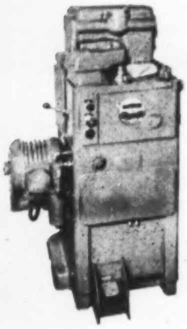
A. F. Davis
secretary
James F. Lincoln Arc Welding Foundation
Cleveland

- *Our story was based on a paper by Reece Stuart II, Pittsburgh-DesMoines Co. That paper received one of the grand prize awards in the James F. Lincoln Arc Welding Foundation competition.—ED.*

...at Low Cost



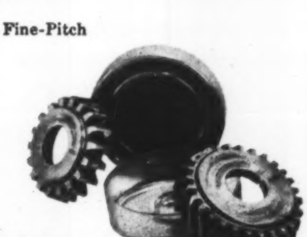
Fellows No. 4 Fine-Pitch Gear Shaving Machine



Fellows 3-Inch Fine-Pitch Gear Shaper

Small Gears, too, can be economically produced on Fellows equipment. The accuracy demands for tiny gears and pinions for the 'electronic age' are being met with tolerances in the low tenths of a thousandth of an inch (that's .0002" for example).

The proof is in the production records of the machines shown at left, used with Original Fellows Cutters and Shaving Tools. We'll be glad to quote some outstanding examples on small gears similar to your requirements. There's a Fellows Representative with the facts at the sales office near you.



For Absolute
Quality Control Tool up
with Original Fellows Cutters

THE Fellows
GEAR SHAPER COMPANY

Head Office and Export Department: 78 River Street, Springfield, Vermont.
Branch Offices: 319 Fisher Bldg., Detroit 2 • 5835 West North Ave., Chicago 39 • 2206 Empire State Bldg., New York 1

STRIPPING ENAMEL . . .

SAVING TIME

*Enthonics**

AT WORK

IMMERSED . . . THE WATCH STARTS!

15 SECONDS . . . WRINKLING TAKES PLACE!

25 SECONDS . . . STRIPPING COMPLETED!

25 seconds from immersion to completed stripping!

That's the fast, dramatic story of ENTHONE Enamel Stripper S-18 in action — another example of *Enthonics at work.**

Enthone Enamel Stripper S-18 is the modern organic stripper developed for removing the newest organic finishes such as Epon or Epoxy coatings and many synthetic enamels from copper, copper alloys, steel and aluminum.

For the right strippers to solve your organic stripping problems fill out a questionnaire we'll send at your request; return it with typical samples of your work. Enthonics will find the answer . . . without obligation!

And ask for your copy of the "Enthone Check List" of literature covering more than 60 products and processes developed for modern electroplating and metal finishing.

* *The Scientific Solution of Metal Finishing Problems*

ENTHONE
INCORPORATED

METAL FINISHING PROCESSES
442 ELM STREET, NEW HAVEN 11, CONNECTICUT
ELECTROPLATING CHEMICALS

Service Representatives and Stock Points: BINGHAMTON, N. Y., Austin F. Fletcher, Inc.; CHICAGO, Ardco, Inc.; CLEVELAND, R. O. Hull & Co.; DALLAS, Weaver Engineering & Supply Co., Inc.; LOS ANGELES, L. H. Butcher Co.

here's the key to a SUCCESSFUL MAINTENANCE PROGRAM

THE REMINGTON RAND KARDEX record combines in a single pocket the complete history of the machine, machine characteristics, repetitiveness of repairs and a record of maintenance service and costs.

Through the use of colored signals the preventive maintenance program is visibly signalled, allowing you to analyze your preventive program at any time *in a matter of seconds.*

You will also need an inventory control system for spare parts. An effective stores control system is as important to your maintenance control program as is your work force. Without proper inventory control of parts, valuable production will be lost and machine down time increased.

Both of these records are shown in our booklet on Maintenance Management. This booklet also contains information on how to:

1) Keep Within Your Operating Budget
2) Reduce Emergency Work Through Planned Maintenance
3) Schedule Man-Hours and Cut Idle Time

send today **for this 8-page booklet which shows in detail, in flow-chart form, how you can streamline your whole maintenance operation at the lowest clerical and equipment cost.**

Remington Rand INC

Room 2010, 315 Fourth Ave., New York 10

Kindly send your free booklet "Assured Equipment Productivity Through Maintenance Management"-X1383.

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CUT GEARS

LARGE OR SMALL
HEAT TREATED OR
PLAIN

SIMONDS has over 60 years' experience in cutting quality industrial gears. We can supply any type of gear in cast or forged steel, gray iron, bronze, Meehanite, rawhide or bakelite in a full range of sizes adaptable to the material. Also heat-treated, case or flame hardened gears of carbon or alloy steel. Send us your requirements for quotation.

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GEAR CUTTING

SIMONDS' facilities can produce any type of custom gear from your blanks if you prefer. Same quality . . . same prompt service.

QUALITY GEARS FOR OVER 60 YEARS

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Also stock carrying distributors of Ramsey Silent Chain Drives and Couplings; and industrial V-belts.

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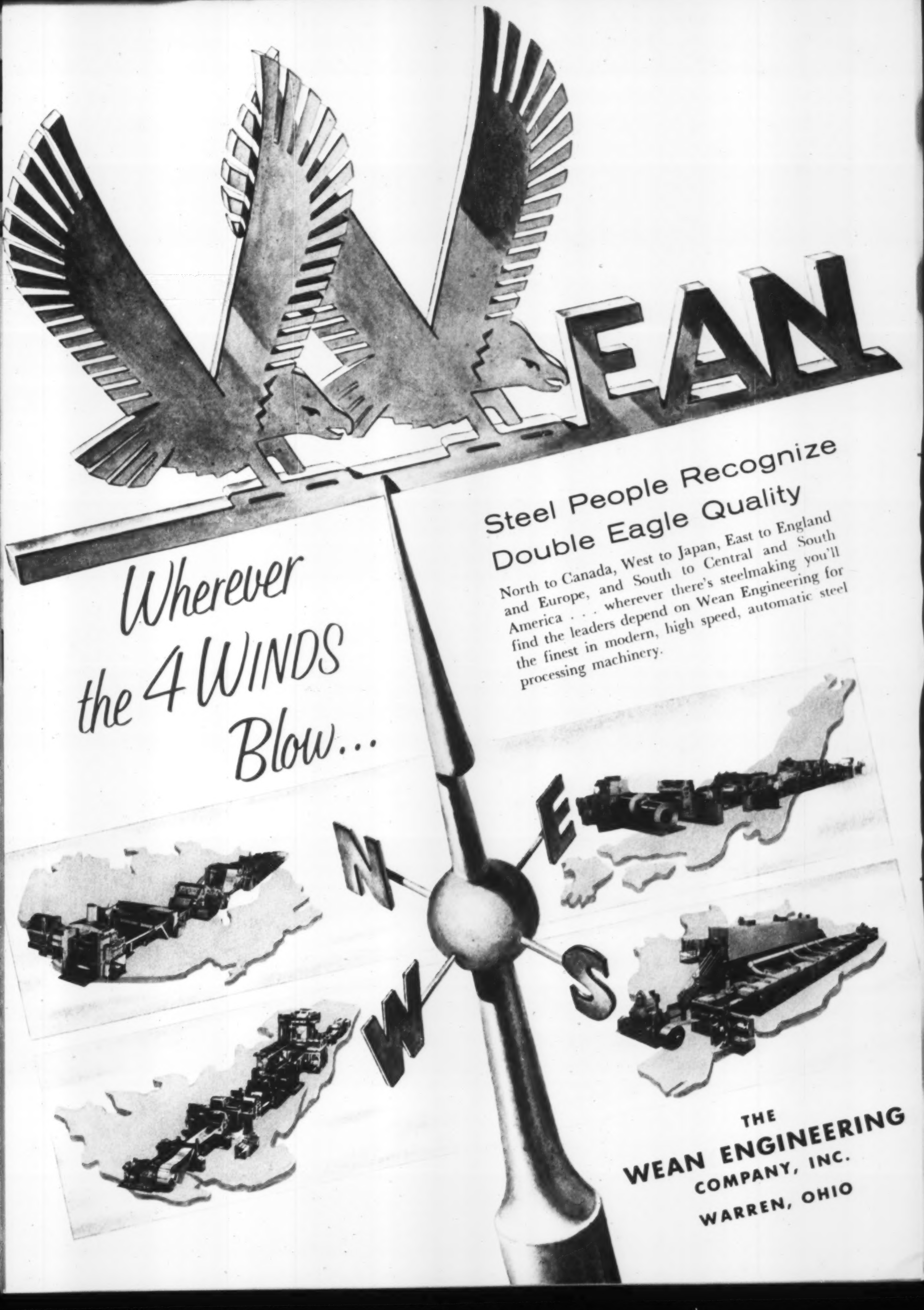
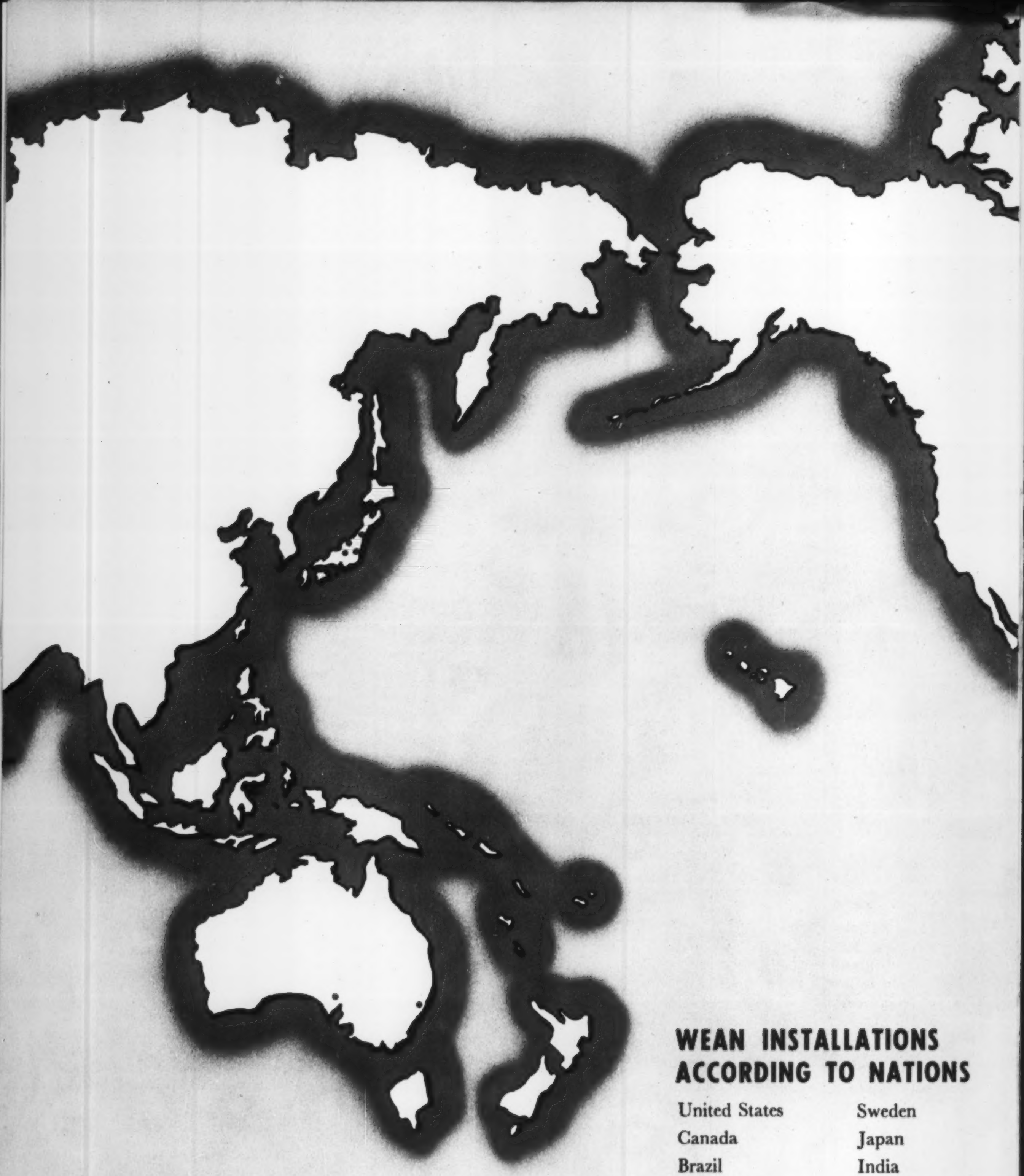


Wherever the 4 WINDS Blow...

Steel People Recognize Double Eagle Quality

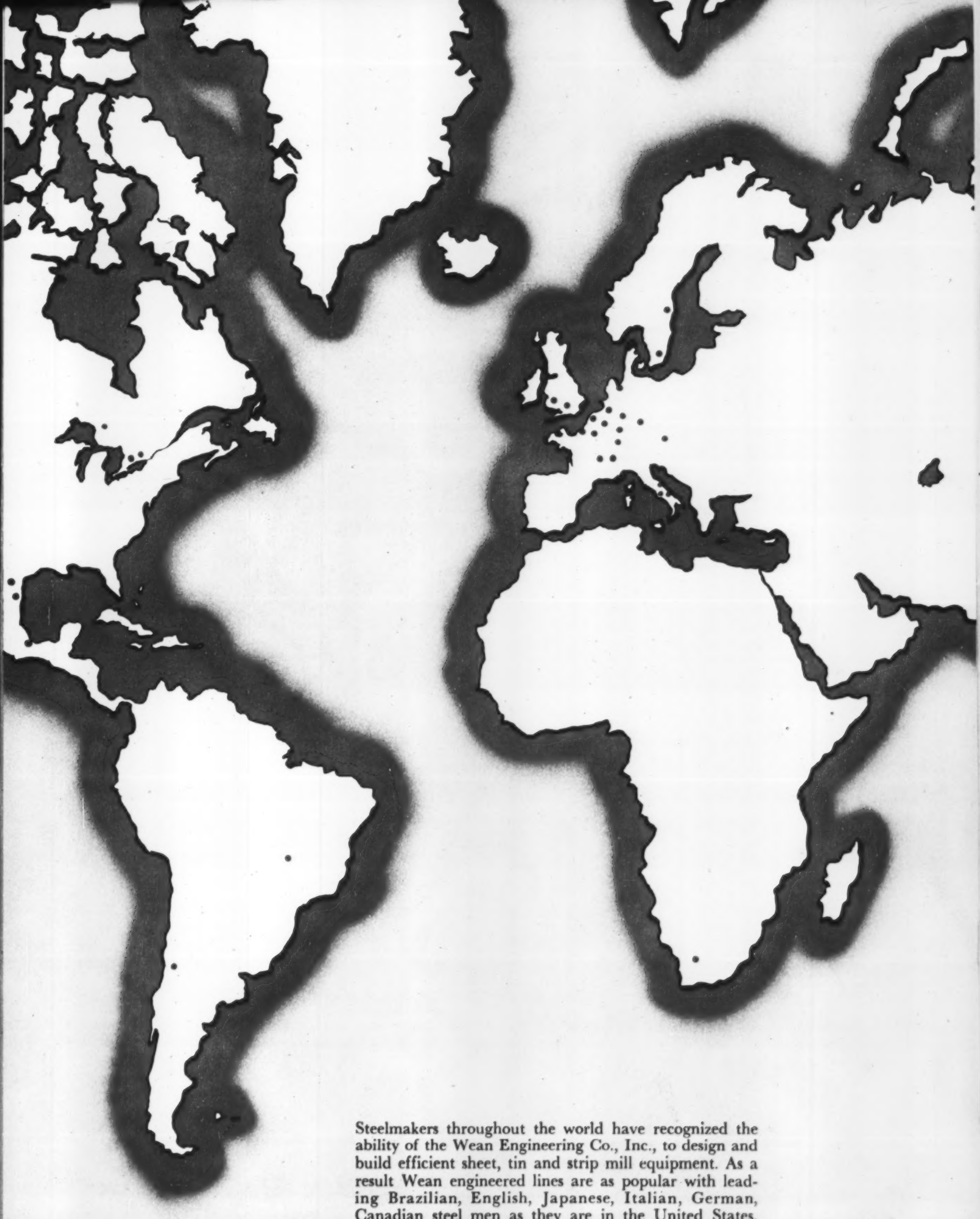
North to Canada, West to Japan, East to England and Europe, and South to Central and South America . . . wherever there's steelmaking you'll find the leaders depend on Wean Engineering for the finest in modern, high speed, automatic steel processing machinery.

THE
WEAN ENGINEERING
COMPANY, INC.
WARREN, OHIO

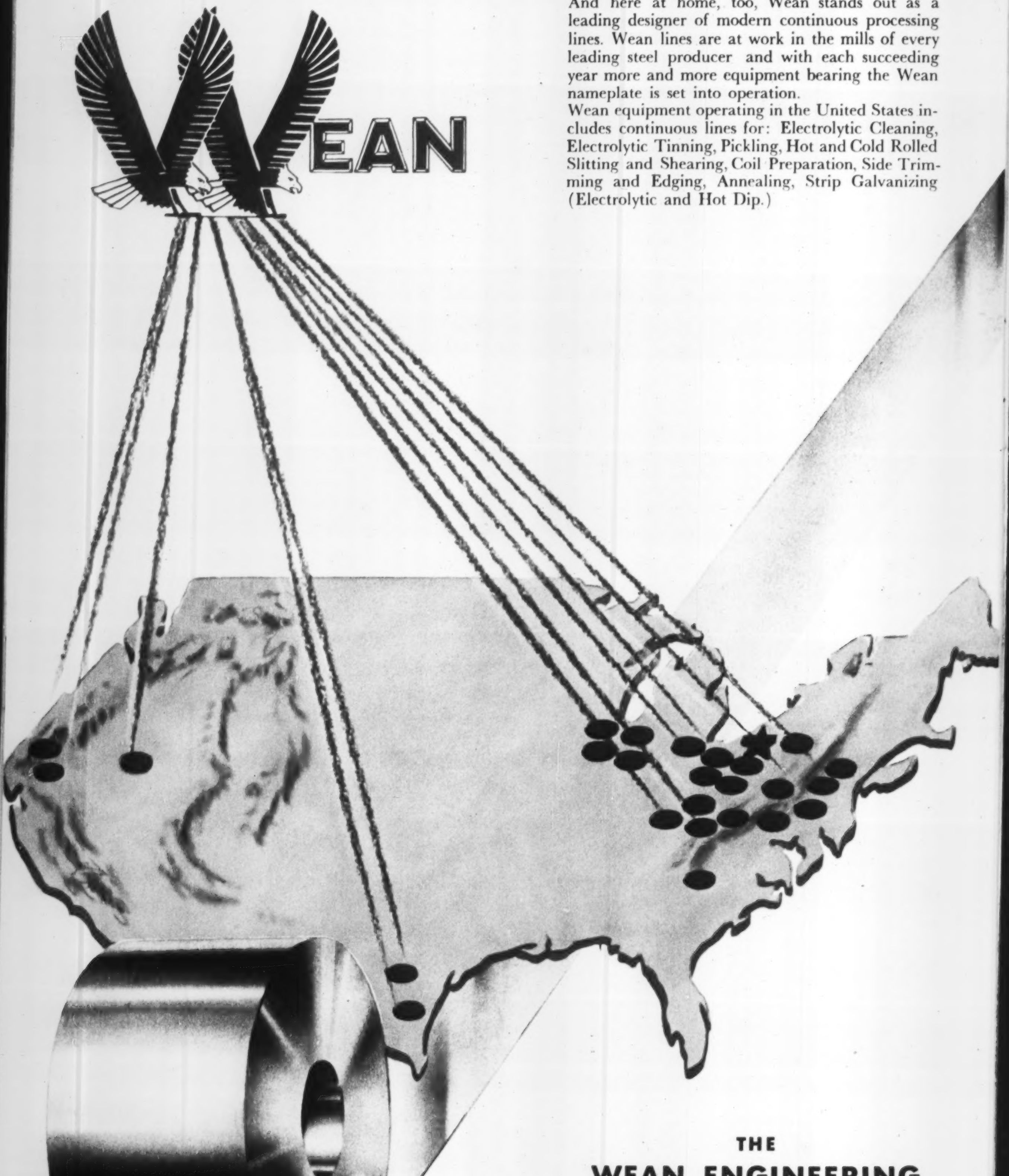


WEAN INSTALLATIONS ACCORDING TO NATIONS

United States
Canada
Brazil
Chile
England
France
Italy
Mexico
Sweden
Japan
India
Australia
U. of S. Africa
Belgium
Luxembourg
Germany



Steelmakers throughout the world have recognized the ability of the Wean Engineering Co., Inc., to design and build efficient sheet, tin and strip mill equipment. As a result Wean engineered lines are as popular with leading Brazilian, English, Japanese, Italian, German, Canadian steel men as they are in the United States. The map on these pages shows the locations of Wean lines now operating outside the continental United States.



And here at home, too, Wean stands out as a leading designer of modern continuous processing lines. Wean lines are at work in the mills of every leading steel producer and with each succeeding year more and more equipment bearing the Wean nameplate is set into operation.

Wean equipment operating in the United States includes continuous lines for: Electrolytic Cleaning, Electrolytic Tinning, Pickling, Hot and Cold Rolled Slitting and Shearing, Coil Preparation, Side Trimming and Edging, Annealing, Strip Galvanizing (Electrolytic and Hot Dip.)

THE
WEAN ENGINEERING
COMPANY, INC.
WARREN, OHIO

ROEBLING
Wire Rope
Recommendations
and Catalog
ROEBLING
WIRE ROPE
TRENTON N.J.

"The right wire rope? That's *EASY* every time!"

IT'S A CINCH to pick the right wire rope for top performance in industry . . . and it pays off! Roebling's new catalog has a section devoted to rope for the industrial field . . . shows at a glance the best rope for each purpose and gives you a simple, unique code number ordering system which for the first time in wire rope history *positively* identifies the desired rope.

Write for your copy of the new "Roebling Wire Rope Recommendations and Catalog." And remember that the Roebling Field Man at your nearest Roebling office or distributor is always available to help find the answer to special wire rope problems.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

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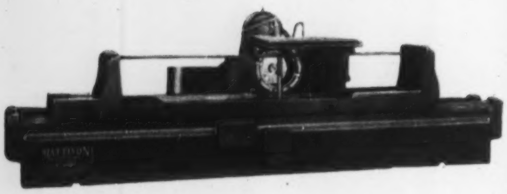
Grinding matching surfaces of connecting rods on Mattison 4000 Face Grinder at Caterpillar Tractor Co.

Matching surfaces of connecting rods are accurately ground on a high productive basis on the Mattison No. 4000 Face Grinder. A special hydraulically operated fixture holds rod and cap in position.

Mattison Face Grinders will handle a wide range of work and are profitably used in virtually all industries — metal working, railroad shops, paper and pulp mills, terra cotta and rubber plants, steel mills and foundries. Ask us for free copy of bulletin 846-2RM for further information on our complete line of Face Grinders.



MATTISON MACHINE WORKS

ROCKFORD • ILLINOIS

What shape is a quality fastener?

Here is a handful of ELASTIC STOP® nuts. Each has ESNA's familiar red locking collar . . . is self-locking and vibration-proof. Each is a readily assembled, one-piece unit. Each provides positive protection against thread corrosion . . . prevents liquid seepage along bolts. Each is made from the finest of raw materials. Each is exactly controlled as to finished dimensions, class of thread fit and finish. Each is now in use on critical applications, with a record for uniform high quality that is unmatched.

Most of them are standard parts. Some originated as the result of a specific request for ESNA's help with an important fastening problem.

Isn't it logical to call on us with your next fastening problem?

ELASTIC STOP NUT CORPORATION OF AMERICA

ESNA TRADE MARK

ROLLPIN TRADEMARK

Elastic Stop Nut Corporation of America
Dept. N62, 1060, 2330 Vauxhall Road, Union, N. J.
Please send the following free fastening information:

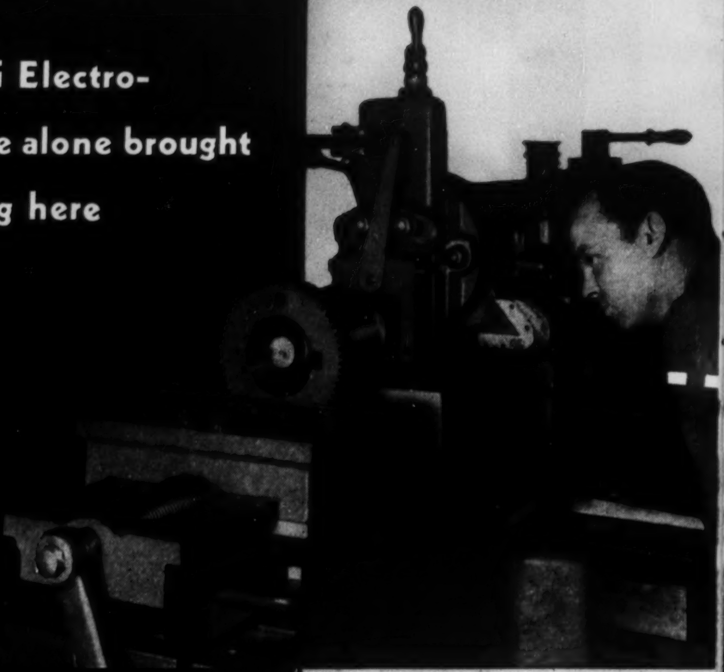
☐ ELASTIC STOP nut bulletin

☐ Here is a drawing of our product. What self-locking fastener would you suggest?

Name________________ Title________
Firm________________
Street________________
City________________ Zone______ State______

Outstanding Time Saver...

The New Cincinnati Electro-Magnetic Clutch and Brake alone brought a 30% time-saving here



Shaping time on 7 internal oil grooves in these steel sleeves was reduced from 12.5 minutes to 8 minutes, by the Cincinnati Electro-Magnetic Clutch and Brake.

The New Cincinnati Magnetic Clutch and Brake, with its single, convenient control lever, gives the operator the fastest, simplest and most accurate control of his Shaper and converts waste time into productive time.

This powerful clutch and brake requires no adjustment, and has a long, maintenance-free life.

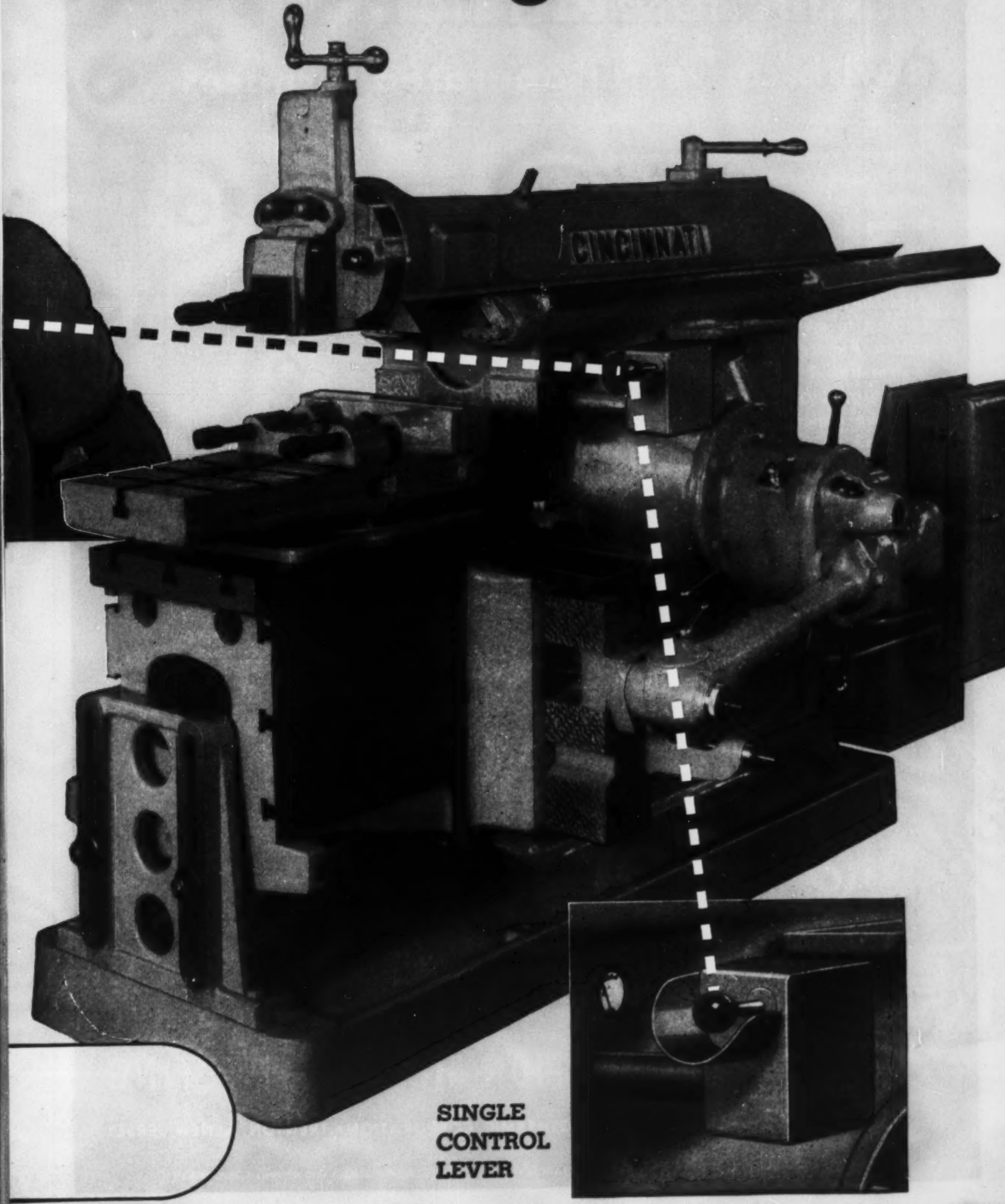
Write for Cincinnati Shaper Catalog N-6.

CINCINNATI

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

...Outstanding ACCURACY


CINCINNATI
SINGLE CONTROL LEVER

THE IDEAL METHOD:

INDUCTION MELTING

with converter-operated furnaces . . .

Wherever metals are heated or melted in small quantities . . . for steel, non-ferrous or precious metal casting, sintering or hot pressing carbides, brazing . . . these self-tuning, low cost converter-operated furnaces are virtually standard equipment.

Ajax-Northrup converters are certified to meet F. C. C. regulations. Furnaces are available in sizes from 2 ozs. to 120 lbs. (For large production—Ajax-Northrup generator-operated furnaces.)

Write for Bulletin 14.

AJAX NORTHRUP SINCE 1916

INDUCTION HEATING-MELTING

AJAX ELECTROTHERMIC CORPORATION • TRENTON 5, NEW JERSEY

ASSOCIATED COMPANIES AJAX ELECTRIC FURNACE CORPORATION • AJAX ELECTRIC COMPANY • AJAX ENGINEERING CORPORATION

CALENDAR
OF MEETINGS

October 3-5, National Association of Sheet Metal Distributors: Annual meeting, Marlborough-Blenheim hotel, Atlantic City, N. J. Association address: 1900 Arch St., Philadelphia 3. Secretary: Thomas A. Fernley Jr.

October 3-6, American Hardware Manufacturers Association: Annual meeting, Marlborough-Blenheim hotel, Atlantic City, N. J. Association address: 342 Madison Ave., New York 17. Secretary: Arthur L. Faubel.

October 3-7, Electrochemical Society Inc.: Fall meeting, Hotel Statler, Boston. Society address: 216 W. 102nd St., New York 25. Secretary: Dr. Henry B. Linford.

October 4-6, American Management Association: Marketing special conference, Conrad Hilton hotel, Chicago. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

October 4-6, National Electronics Conference: Annual meeting and exhibit, Hotel Sherman, Chicago. Conference address: 84 E. Randolph St., Chicago 1. Executive secretary: John S. Powers.

October 5-7, American Institute of Electrical Engineers: Middle Eastern district meeting, Abraham Lincoln hotel, Reading, Pa. Institute address: 33 W. 39th St., New York 18. Secretary: N. B. Hibshman.

October 5-9, Society of Automotive Engineers Inc.: National aeronautic meeting, production forum and aircraft engineering display, Hotel Statler, Los Angeles. Society address: 39 W. 39th St., New York 18. Secretary: John A. C. Warner.

October 6, American Iron & Steel Institute: Regional closed technical meeting, Warwick hotel, Philadelphia. Institute address: 350 Fifth Ave., New York 1. Secretary: George S. Rose.

October 6-8, National Foundry Association: Annual meeting, Hotel Sheraton, Chicago. Association address: 53 W. Jackson Blvd., Chicago. Executive secretary: Charles T. Sheehan.

October 10-13, Controllers Institute of America: Annual national conference, Edgewater Beach hotel, Chicago. Institute address: 1 E. 42nd St., New York 17. Managing director: Walter Mitchell Jr.

October 10-13, National Automatic Merchandising Association: Annual meeting and exhibit, Armory, Washington. Association address: 7 S. Dearborn St., Chicago. Executive director: C. S. Darling.

October 11-13, American Management Association: Fall manufacturing conference, Plaza hotel, New York. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

October 11-15, American Institute of Electrical Engineers: Fall general meeting, Morrison hotel, Chicago. Institute address: 33 W. 39th St., New York 18. Secretary: N. B. Hibshman.

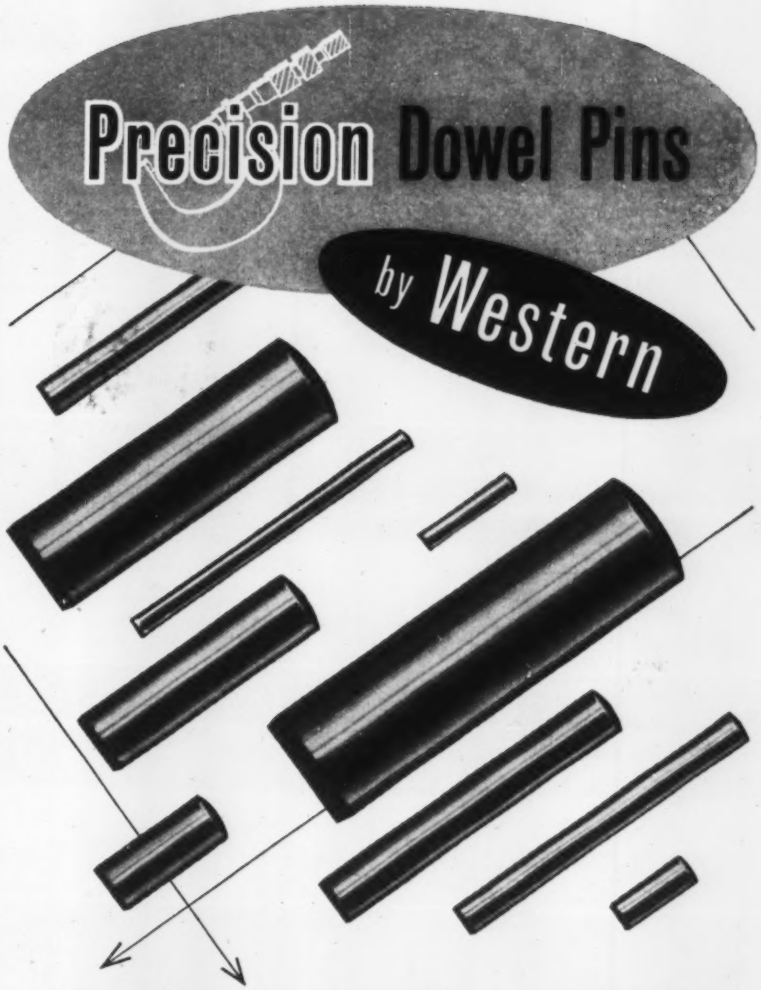
October 12-13, The Society of the Plastics Industry Inc.: New England section meeting, Mt. Washington hotel, Bretton Woods, N. H. Society address: 67 W. 44th St., New York 36. Executive vice president: Wm. T. Cruse.

October 12-14, American Gas Association: Annual meeting, Municipal Auditorium, Atlantic City, N. J. Association address: 420 Lexington Ave., New York 17. Secretary: Kurwin R. Boyes.

October 12-15, American Chemical Society, Chicago Section: National chemical exposition, Coliseum, Chicago. Society address: 86 E. Randolph St., Chicago 1. Manager: James J. Doheny.

October 13-15, National Industrial Conference Board Inc.: Atomic energy conference, Hotel Commodore, New York. Board address: 247 Park Ave., New York 17. Secretary: Herbert S. Briggs.

October 14, American Iron & Steel Institute: Regional closed technical meeting, Hotel William Penn, Pittsburgh. Institute address: 350 Fifth Ave., New York 1. Secretary: George S. Rose.



Any size, any quantity . . . shipped from stock the day you order them!

For your convenience Western carries enormous stocks of these case-hardened, alloy steel dowel pins in all standard sizes. Standard diameters from 1/8" to 1"—standard lengths from 3/8" to 6".

Whatever your precision parts requirements, it pays you to *standardize* on Western. You get your parts *as* you want them *when* you want them by using Western's 81 years of experience in precision manufacturing techniques.

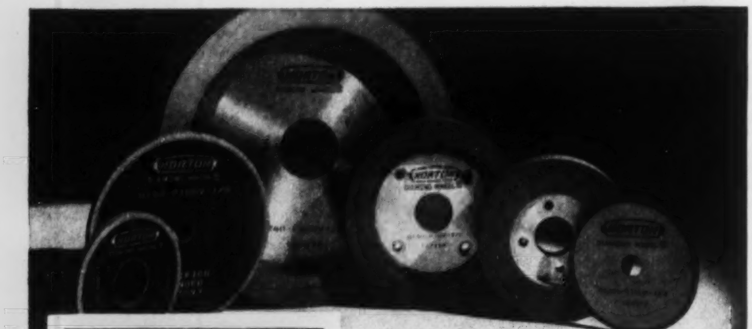
Why not write today for Western's catalog and prices?

Western Automatic
Machine Screw Company
377 Woodland Ave., Elyria, O.

Precision Screw Products, Parts and Assemblies Since 1873

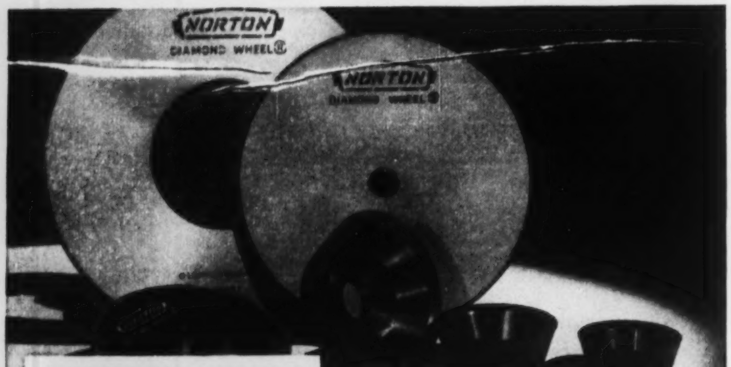
On any carbide grinding job...

Nothing cuts like a Norton diamond wheel



Norton Vitrified Bonded Diamond Wheels outperform all others of this type. They combine the fast cutting action of resinoid bonded wheels with resistance to grooving approaching that of metal bonded wheels. Great durability is another advantage.

◀ *Production Grinding of Single Point Carbide Tools* is most economical and efficient with Norton vitrified bonded diamond wheels. Grinding chip breakers, as illustrated, is another important job for which they are ideal.



Norton Resinoid Bonded Diamond Wheels combine fast cutting with long, money-saving wheel life that makes them favorites for precision sharpening. Made in two bond types — regular, for wet grinding and B6, for dry grinding. It is always more economical to use each bond type on the applications for which it is best suited.

◀ *On Your Multi-Tooth Grinding Jobs*, Norton resinoid bonded wheels hold size so that each tooth gets uniform grinding. The straight, thin shapes make excellent cut-off wheels for salvaging damaged carbide tools.

Diamond wheels in carbide grinding more than pay for themselves. "It's like finding money."

You can cut grinding time — and grinding costs — to the lowest possible by standardizing on Norton diamond wheels.

As a result of Norton Company's long pioneering† in diamond wheel development, Norton diamond wheels bring you a combination of long service life and efficient cutting action that means maximum economy — across the entire range of carbide grinding applications.

Besides the vitrified and resinoid bonded types shown here, Norton diamond wheels are also available in a metal bond — where durability and resistance to grooving, rather than a fast rate of cut, are primary considerations. For every application the proper size and type of Norton wheels are available in a wide variety of grit sizes.

NOTE: For small-volume carbide grinding requirements, especially in single-point applications, Norton K Bond CRYSTOLON* *wheels are often the best investment. Their high stock removal rate and uniform performance assure quality grinding at lowest cost. And they are made in half-grade increments of hardness, enabling you to "pin-point" your specifications.*

See Your Norton Distributor

for aid in selecting the right Norton wheels for every grinding job. And ask him for the 142-page, illustrated booklet: "Grinding Carbide Tools." Or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities. Listed under "Grinding Wheels" in your classified phone directory. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

W-1581

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and its BEHR-MANNING division

NORTON: Abrasives • Grinding Wheels • Grinding Machines • Refractories
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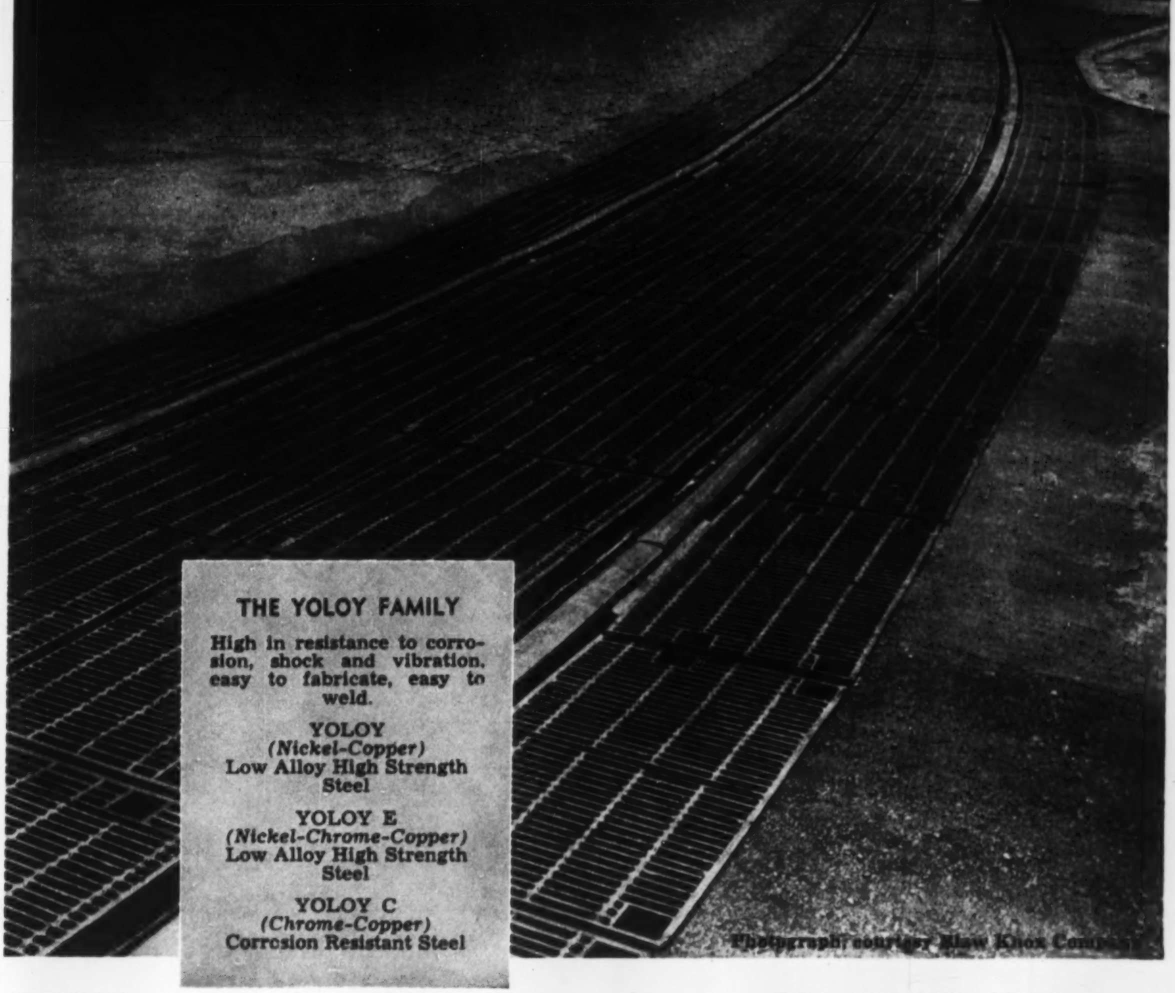
*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

†First with resinoid bonded, first with metal bonded, first with vitrified bonded diamond wheels.

Grating of *Yoloy* E Steel makes smoother, safer crossing



Photograph courtesy Blaw Knox Company

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High in resistance to corrosion, shock and vibration, easy to fabricate, easy to weld.

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Corrosion Resistant Steel

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●Crossings of Yoloy E "Electro-forged"* steel grating provide a sure means to increased safety and improved appearance of railroad property - an investment that promotes public good will. For full data on the Yoloy family of steels phone or write our nearest District Sales Office.

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SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - BAR SHAPES - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - RAILROAD TRACK SPIKES

G.E. announces new d-c brake

ONE ADJUSTMENT FOR BRAKE LINING WEAR CUTS MAINTENANCE TIME

USING AISE DIMENSIONS, General Electric's new d-c brake is designed to simplify and speed brake maintenance. *One* easy adjustment compensates for lining wear on *both* brake shoes. Even when there is unequal wear on the linings, a self-centering fulcrum automatically compensates both shoes when you make the single adjustment.

Power connection, torque setting and shoe adjustment are all made at one end of the brake with only a wrench. No need to keep both ends clear for servicing—permits mounting in comparatively inaccessible locations.

Save time, too, in replacing worn linings. Simply remove two bolts, slide the old lining out. You can remove coils without the necessity of disassembling the entire magnet structure.

FOR MORE INFORMATION, write for the new descriptive bulletin, GEA-6214, or contact your nearest G-E Apparatus representative. Section 780-6, General Electric Company, Schenectady 5, N. Y.

FIELD-TESTED—Assistant Maintenance Foreman at Jones & Laughlin Steel Corp. makes check on new brake during on-the-job tests. Brake was also thoroughly lab-tested by G.E.

ARMATURE GAP INDICATOR—this easily visible indicator shows when to make adjustment for lining wear.

MANUAL RELEASE—this convenient mechanism provides a positive method of manually releasing the brake.

STRONGBOX MAGNET COIL—seals out dust, moisture, oil. Windings protected from mechanical damage.

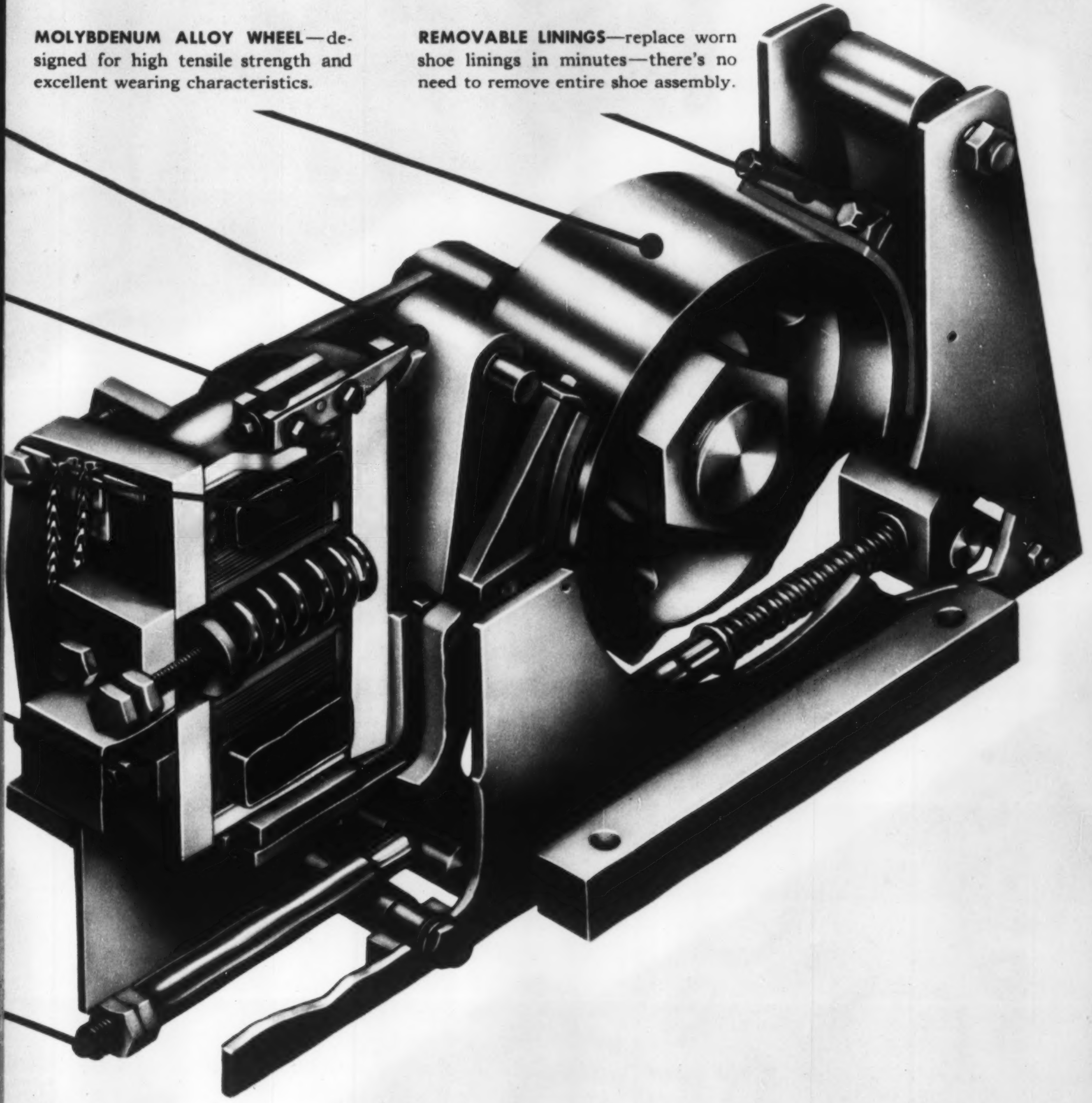
TERMINAL STUD CONNECTIONS—speeds wiring—protects magnet leads from strain. Easily accessible.

SINGLE-POINT ADJUSTMENT — one simple adjustment for lining wear speeds maintenance. Only a wrench is needed to adjust magnet gap. Equal shoe clearance is obtained automatically. No trial-and-error adjustment — brake is designed to be self-centering.

built to AISE Standards

MOLYBDENUM ALLOY WHEEL—designed for high tensile strength and excellent wearing characteristics.

REMOVABLE LININGS—replace worn shoe linings in minutes—there's no need to remove entire shoe assembly.



Progress Is Our Most Important Product

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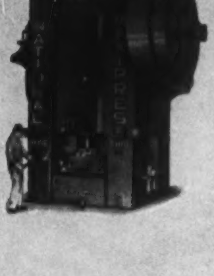
MODERN FORGING AT Ford

This new-design High Speed Forging MAXIPRES is hot-extruding ball-joint suspension forgings at the Ford Motor Co. Forge Plant, one of the world's largest, in Canton, Ohio.

Ford uses 7 MAXIPRESSES, 8 REDUCEROLLS and 24 NATIONAL High Duty Forging Machines—39 units in all—for many of its forgings.

If you have a forging problem—large or small, hot or cold, ferrous or non-ferrous—let us help you solve it. Send us your prints and sample parts, or better yet, visit us. No obligation.



MAXIPRESSES are available in 13 sizes from 300 to 8,000 tons.

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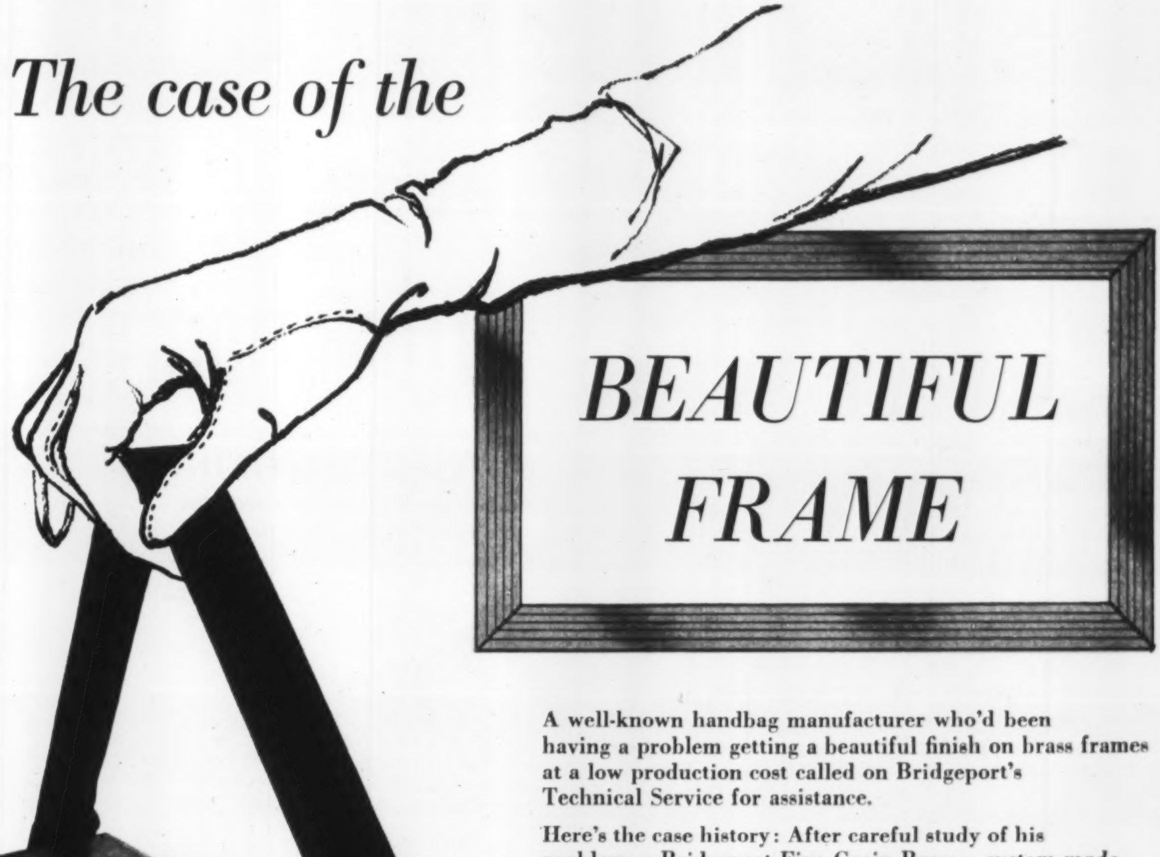
MACHINERY COMPANY
TIFFIN, OHIO—SINCE 1874

DESIGNERS AND BUILDERS OF MODERN FORGING MACHINES • MAXIPRESSES • REDUCEROLLS • COLD HEADERS • BOLTMAKERS • NUT FORMERS • TAPPERS • NAILMAKERS

Hartford Detroit Chicago

The case of the BEAUTIFUL FRAME



Handbag product of The Randolph-Rand Corporation, New Rochelle, New York.

A well-known handbag manufacturer who'd been having a problem getting a beautiful finish on brass frames at a low production cost called on Bridgeport's Technical Service for assistance.

Here's the case history: After careful study of his problem, a Bridgeport Fine Grain Brass – *custom made to the exact grain size best suited to the manufacturer's requirements* – was recommended. This vanity case quality metal was selected because the fine grain surface needs little finishing and the brass works well. Look at those 90° bends, for example, and notice how the brass is stiff enough to hold the cloth of the bag by itself.

By using Bridgeport Fine Grain Brass and improved techniques, a beautiful, lustrous finish was attained and *production per man in the finishing department increased five times.*

This is another case history to prove that *no single fine grain brass can do all jobs well.* A whole range of fine grain sizes is available, and since there is no one pat answer for all finishing problems, Bridgeport recommends the exact fine grain size only after consideration of all factors.

To find out how Bridgeport can help you improve your product and lower manufacturing costs with the right metal for your needs, call your nearest Bridgeport Sales Office.

Write for a free copy of Bridgeport's folder on Grain Size – "The Fourth Dimension."

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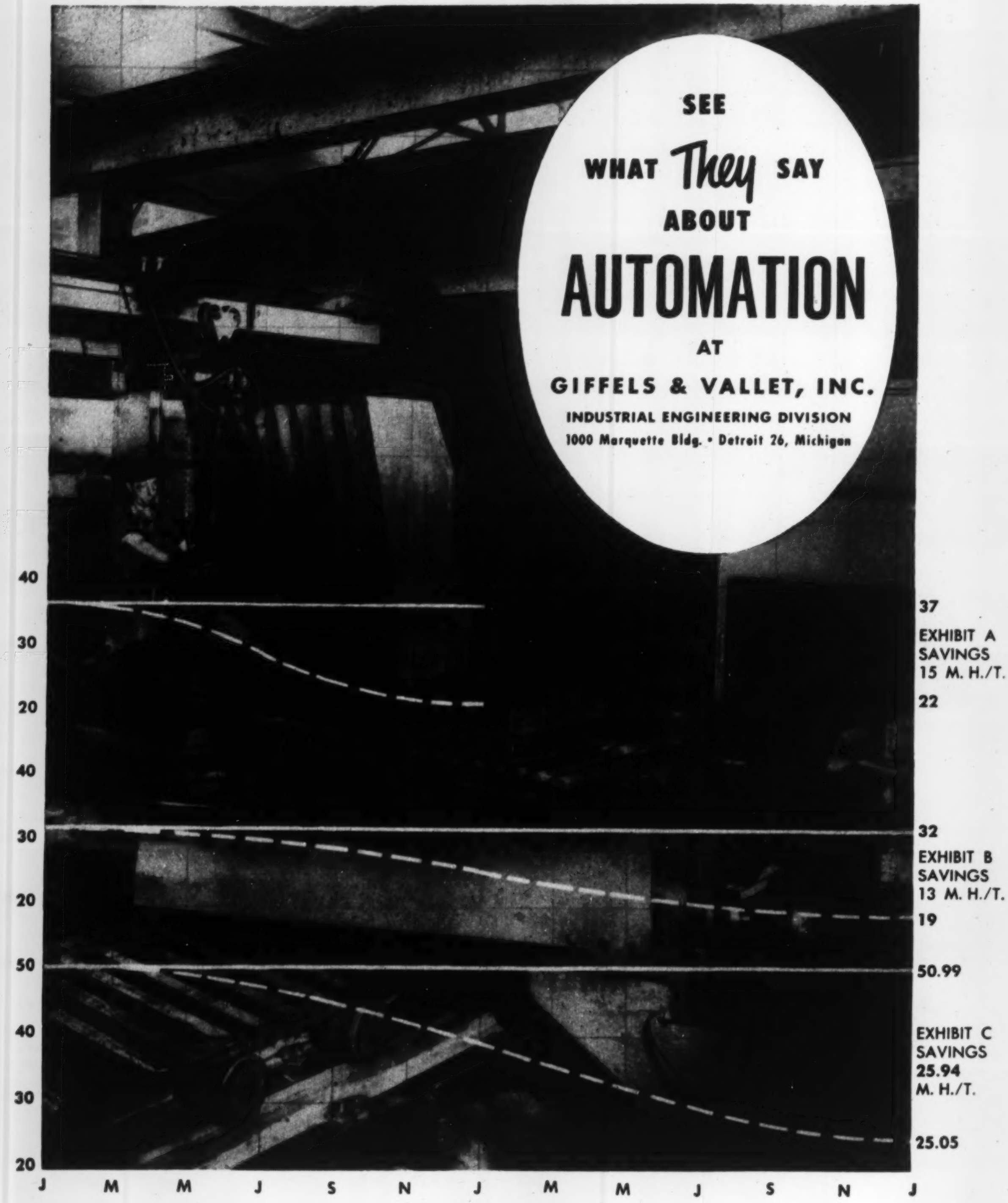
In Canada: Noranda Copper and Brass Limited, Montreal

Visit Bridgeport's booth 1015 at the National Metal Exposition in Chicago, November 1-5.



THREE ACTUAL EXAMPLES OF SAVINGS IN MAN HOURS PER TON OF PRODUCTION. GIFFELS & VALLET HAS BEEN ENGINEERING AUTOMATION FOR INDUSTRY FOR OVER 25 YEARS.

We will gladly, without obligation, discuss your production problems and the assistance we could render.

one is always best

. . . *and* **REX** *is the standard by which all high speed steels are compared*

No matter how keen the competition, there can be only one winner. And the difference between the winner and the runner-up, whether it's golf or making high speed steels, is measured in performance.

Crucible REX® high speed steels have proved their championship qualities under the toughest sort of competition — in actual use in thousands of tool shops throughout the world. But check for yourself. Try a piece of REX high speed steel on your next job. Compare its hardenability, response to heat treatment, its fine tool performance. You won't find another high speed steel to outperform REX.

Ask for REX by name wherever high speed steels are sold. But remember, REX is made *only* by Crucible.

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CRUCIBLE first name in special purpose steels

54 *years of* *Fine* *steelmaking* **TOOL STEELS**

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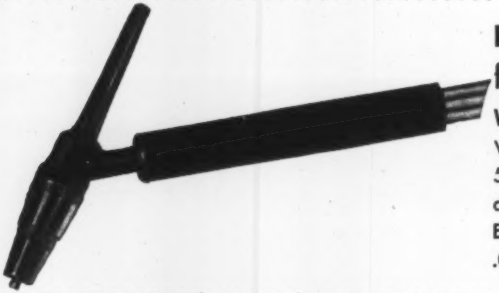
Trade-Mark

HW-9
for light welding
Air-cooled—
75 amp. a.c.h.f., d.c.s.p.
Electrode sizes:
.020 to 1/16 in.

HW-10
for general welding
Water-cooled—
300 amp. a.c.h.f.,
d.c.s.p., d.c.r.p.
Electrode sizes:
.040 to 1/8 in.



HW-12
for heavy-duty welding
Water-cooled—
500 amp. a.c.h.f.,
d.c.s.p., d.c.r.p.
Electrode sizes:
.040 to 1/4 in.

HW-8
for spot-welding
Water-cooled—
250 amp. a.c.h.f., d.c.s.p.
Electrode sizes:
1/8 to 5/32 in.

HW-13
for mechanized welding
Water-cooled—
500 amp. a.c.h.f., d.c.s.p.
Electrode sizes:
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WELD ALL THESE METALS WITHOUT FLUX

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- cast iron
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GREATEST WELDING SPEED

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Qwik Change

with PACKAGED Motor Starter PARTS!

PARTS KIT
ELECTRICAL EQUIPMENT
START
STOP

New PUSH BUTTON KIT

OTHER KITS...

- Selector Switches
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- Coils
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EASY to Identify!

Easy-to-read catalogs, simplified motor control and overload relay selectors, illustrated service bulletins...these all combine to assure *quick changes* through easy parts identification.

EASY to Buy!

Conveniently packaged and labeled conversion parts are immediately available "off-the-shelf" from nationwide network of authorized Square D electrical distributors.

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Write for Bulletin 9999. Address Square D Company, 4041 North Richards Street, Milwaukee 12, Wisconsin.

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SQUARE D COMPANY

QUALITY in B & W CARBON STEEL

SEAMLESS

MECHANICAL TUBING

Makes Your Fabricating Easy

A — AVAILABILITY
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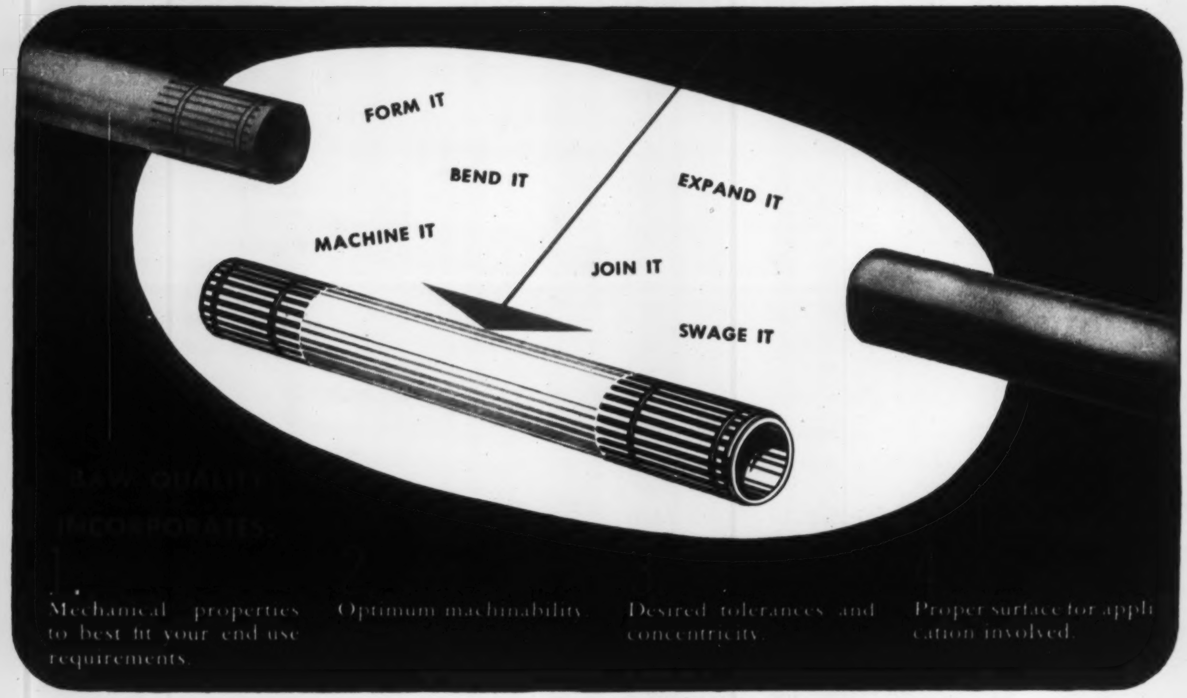
Q — QUALITY



B&W QUALITY INCORPORATES:

- Mechanical properties to best fit your end use requirements.
- Optimum machinability.
- Desired tolerances and concentricity.
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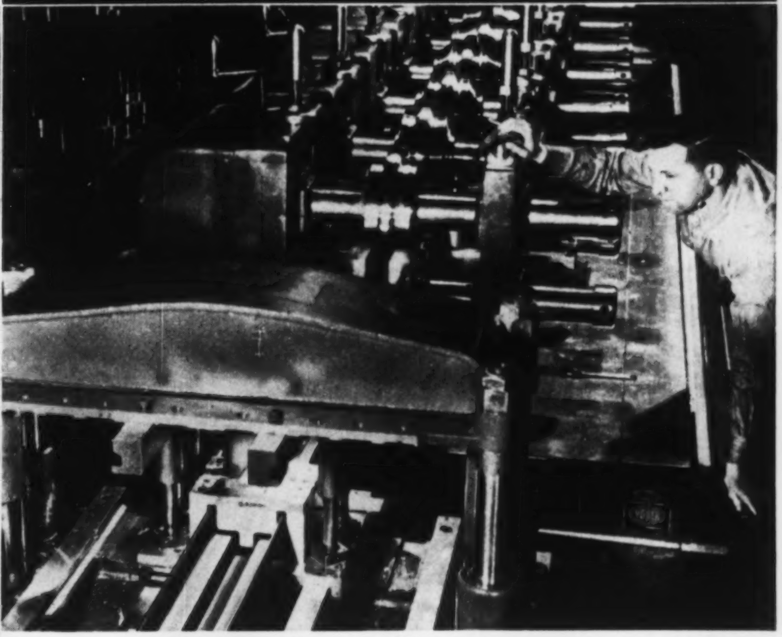
remember ASQ *is meant for you*

B&W SEAMLESS and WELDED TUBES

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

TA-4051 (CSM)

Cold-Roll-Forming



simplest, fastest, most economical–

In the assembly of your products, to the wide extent that cold-roll-formed components can be used, substantial economies can be effected.

A Yoder Cold-Roll-Forming Machine with one operator and a helper will make upwards of 30,000 feet per day. Thus the cost usually is only a small fraction of a cent per foot for converting strip into structural shapes, trim, mouldings, panels, tubular or box shapes.

The machine may, therefore, be highly profitable even if operated only a few days per month. After you install it for a given purpose, you are likely to discover other things which can be done better and more cheaply on it than by methods heretofore employed.

You may also find it practical to combine other operations with cold-forming, such as curving, coiling, embossing, welding, perforating, notching, etc., at little or no extra labor cost. Yoder engineers are always glad to assist in making up such multi-function production lines.

The Yoder Book on Cold Roll Forming is a valuable source of information on the scope, mechanics and economics of the art. Send for free copy.

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Complete Production Lines

★ COLD-ROLL-FORMING and auxiliary machinery

★ GANG SLITTING LINES for Coils and Sheets

★ PIPE and TUBE MILLS — cold forming and welding

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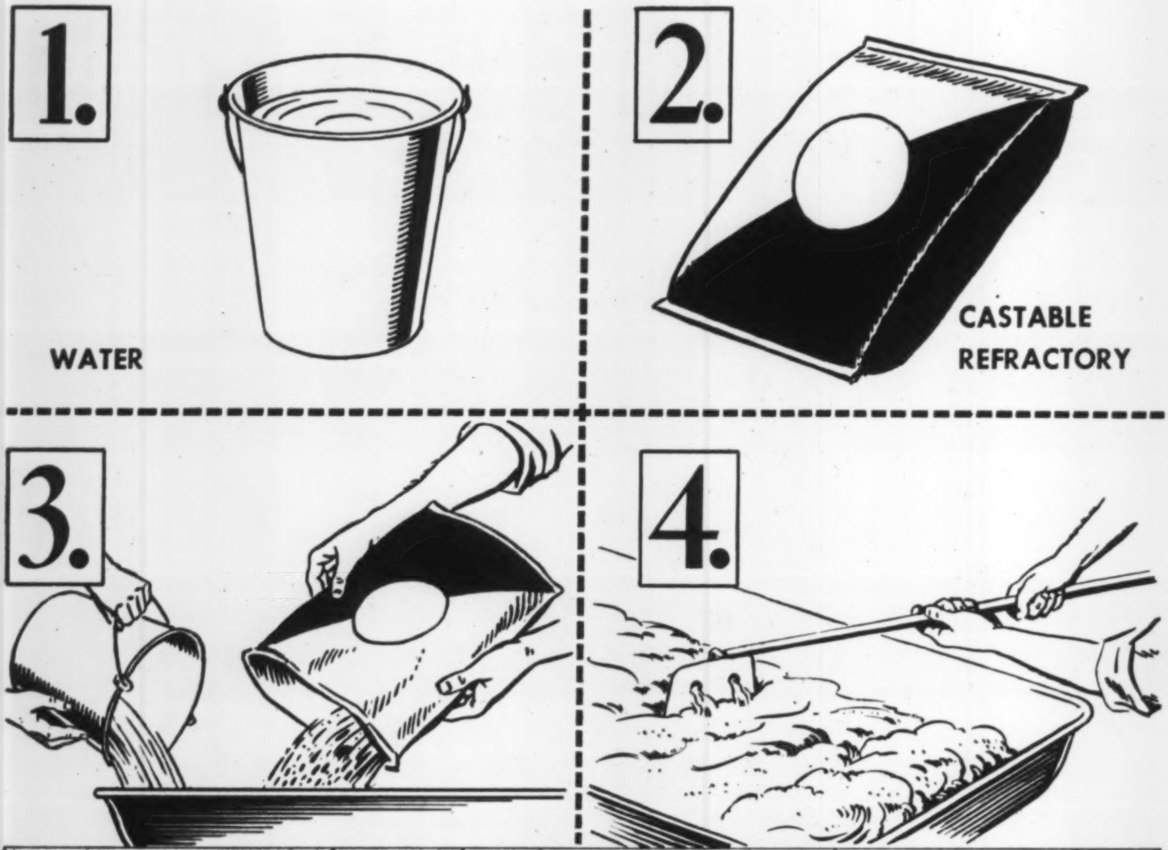

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is easy to make with a Castable Refractory

Just add water to a packaged castable, mix, and you're ready to place refractory concrete. Castable refractories supply you with the right combination of selected aggregates and Lumnite* calcium-aluminate cement carefully proportioned to meet the heat resistance and insulation requirements of many jobs.

Chances are this convenient way to make Refractory Concrete can speed work and cut costs on your next refractory job. Why not keep a few bags on hand—you'll have "two strikes" on your next emergency repair! Castables are made and distributed by manufacturers of refractories.

Refractory concrete made with castables is the *adaptable* refractory—can be easily placed in any size or shape . . . resists severe thermal shock and spalling. It can be poured, troweled or "shot" on by cement gun, and it's ready for service in 24 hours or less.

For additional information, write Lumnite Division, Universal Atlas Cement Company, (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y. or contact any of the offices shown below.

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*"*LUMNITE*" *is the registered trade-mark of the calcium-aluminate cement manufactured by Universal Atlas Cement Company.*

S-L-94

ATLAS® **LUMNITE for INDUSTRIAL CONCRETES**

REFRACTORY, INSULATING, OVERNIGHT, CORROSION-RESISTANT

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UNITED STATES STEEL HOUR—Televised alternate weeks—See your newspaper for time and station.

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High quality stainless sheet
and strip steel . . . for the product
you make today and the
product you plan for tomorrow.

McLouth Steel Corporation
DETROIT, MICHIGAN
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A ROLLING MILL GATHERS A PROFIT...

ONLY WHEN all the techniques of efficient production are employed, can your mill roll at a profit. These techniques include effective lubrication — and Texaco's steel mill experience, its facilities and made-for-the-job lubricants, can be of profitable assistance to you.

Steel men find, for example, that *Texaco Meropa Lubricant* — with special Extreme Pressure properties — gives outstanding protection to enclosed reduction gears and bearings. Similarly, *Texaco Regal Oil* — a heavy, turbine-quality circulating oil with high oxidation-resistance — protects oil film bearings on roll necks.

For the steel industry, there is a complete line of Texaco Lubricants backed by famous Texaco Lubrication Engineering Service. Find out how they can gather a profit for *your* mill. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

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STEEL

October 4, 1954

Metalworking Outlook

Talk About Labor Unity

The weather and unification of labor have at least one thing in common: Everybody talks about both, but nobody does much about either. There was even more talk than usual about unity late last month because of the AFL and steelworker conventions. Odds are that the talk will result in little action. Steelworker President David J. McDonald proposes that all organized labor merge into a single federation. AFL leaders immediately expressed doubts, particularly on what to do about John L. Lewis and his United Mine Workers.

Lewis Stirs Rumors

A lot of the unity talk, paradoxically, is stimulated by John L. Lewis. The coal industry and his union are in economic troubles, so he's shopping around for a labor partner. Bituminous production this year will be less than 400 million tons, the lowest since before World War II. The stopgap U. S. plan to buy 10 million tons to give to friendly European countries by next June 30 will help, but it's no solution to the industry's basic ills. Significantly, Mr. Lewis is saying nothing about contract demands. And he probably won't until miners are working more than their present three days a week.

Toe in the Door

Ford Motor Co.'s closing of a sawmill plant at L'Anse, Mich., raises the issue of vesting rights. The company and the United Auto Workers agreed to modify their national agreement to provide L'Anse workers 50 or over and with 20 or more years of service deferred retirement benefits beginning at age 65. Edwin Shields Hewitt & Associates, a Libertyville, Ill., management consulting firm, points out that UAW wants to extend the principle of vesting to its national agreements with all auto companies. The union got its toe in the door at L'Anse.

Republic Drops County Pricing

Republic Steel Corp. today (Oct. 4) abandons its county-symbol pricing system. The company late last year introduced the method which gives the delivered price on a product in the buyer's own county. The system was applied initially only to bars, but original plans were to use it for all products. Now, the method won't be used at all (see p. 147). One reason for the decision is that the system hasn't caught on with other steel companies. As just another pricing method, Republic feels that it would tend to confuse the buyer.

Uranium Mining: Mushroom Growth

Uranium ore production in the U. S. has been doubling every 18 months and even greater expansion is just ahead. Atomic Energy Commission's Jesse C. Johnson estimates that we now have a $100-million-a-year uranium industry, largest in the world. That size is particularly remarkable since America had virtually no domestic uranium industry before 1948. Besides the U. S., the free world now gets most of its uranium in Canada, Australia, South Africa, Belgian Congo, France and Portugal. South America is virtually unprospected for the element, although several finds have been made.

Problems in Heat Pumps

Industrial and commercial users are the heat pump's best customers today. Some engineers think the big domestic market won't be seriously tapped until better solutions are found to several technical problems, such as the accumulation of frost on the outside coil when the temperature drops below 40° F. Until that and other matters are solved, the successful use of the heat pump will be confined to customers who have well water—a limited number of homes mostly in rural areas and a larger number of industrial and commercial facilities.

Heavy Strength for Light Metals

Look for a continued growth in the number of firms that make products of light metals, particularly aluminum. Nearly 22,000 firms in the U. S. now do, compared with only 4000 ten years ago. Manufacturers, producing everything from airplanes to zippers with aluminum, total 15,280. In addition, there are 4050 fabricators and 2619 die casters and foundries. Aluminum has some 4000 diversified uses, says J. Walter Thompson Co.

Coming: More Freight Rate Hassle

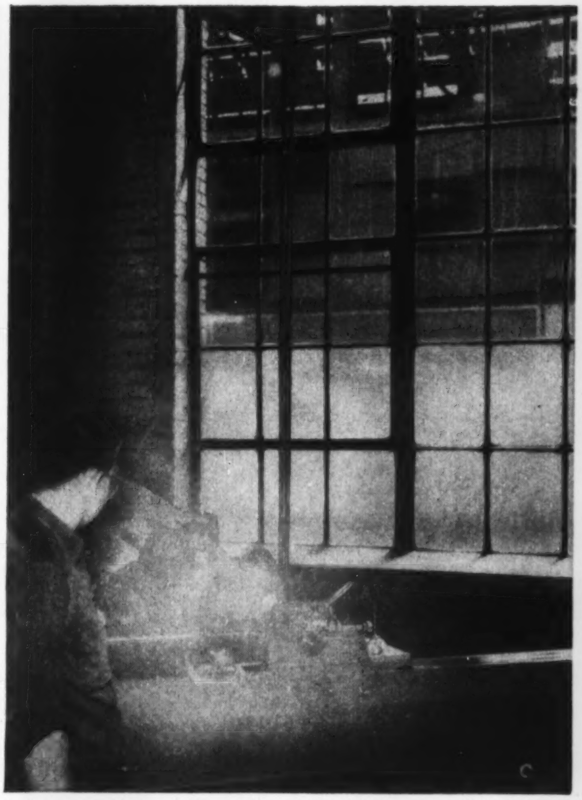
Watch for another flare-up on iron and steel freight rates in November. Eastern iron and steel truckers now admit the 15 per cent rate cut on steel products granted the railroads last March is hurting. Interstate Commerce Commission was to hold hearings on the matter last month, but has postponed the sessions until Nov. 9. Then, the truckers will have their innings.

Straws in the Wind

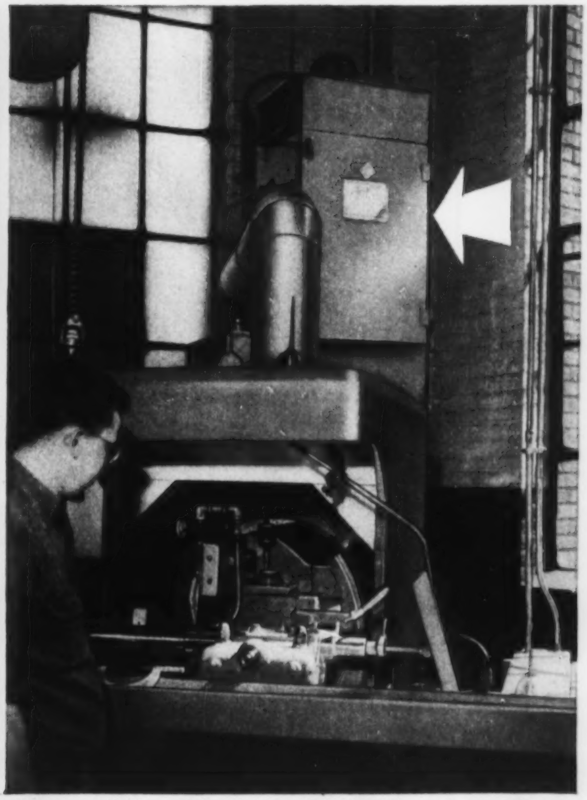
Work on the American portion of the St. Lawrence Seaway will begin "with intensity" next spring and is scheduled for completion by early 1959 . . . More than 2,250,000 tons of iron ore have been shipped to the U. S. from Peru since deposits were opened last year by Marcona Mining Co., formed by Utah Construction Co. and Cyprus Mines Corp. . . . An investigation of fluorspar has been launched by the Tariff Commission to ascertain "the effect upon the competitive position of the domestic fluorspar industry of the present tariff status of imported fluorspar." . . . Food Machinery Corp. has won a $26.5-million government contract to produce M-59s, the armored infantry vehicle.

This Week in Metalworking

STEEL's quarterly survey shows that inventories of industrial components will rise moderately next quarter (p. 51) . . . Equipment builders are turning more to long-term financing to boost sales (p. 52) . . . Iron and steel engineers got a preview of some of the equipment they'll be using for the next wave of steel expansion at the Iron & Steel Show in Cleveland last week (p. 53) . . . The civilian atom gets more attention (p. 57) . . . Planning a sales training school? For how one company went about the job see p. 62.



Before installation of Precipitron Oil Mist Control, this high-speed grinder developed as much as 10 gallons of oil mist in a single shift. Result: menace to workers' health . . . fire hazard . . . efficiency depressant.



After installation of Precipitron Oil Mist Control, oil mist from the same high-speed grinder is no longer a problem. Precipitron traps the extremely small particles of oil, dirt and smoke—*electronically*—leaves air clean, safe.

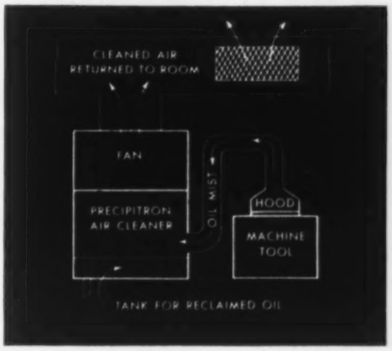
Westinghouse PRECIPITRON® Eliminates Coolant Oil Mist as Hazard . . . Pays For Self Through Upped Efficiency, Fuel Savings

Electronic air cleaner more efficient, economical than mechanical air filtration.

Westinghouse Precipitron Oil Mist Control is the positive way to free your plant of dangerous, costly oil mist. Precipitron improves visibility, boosts operating efficiency, eliminates hazardous working conditions, strengthens employee morale—*and pays for itself at the same time!*

Present installations show savings of thousands of dollars yearly, directly in fuel, housekeeping expenses and salvaged cutting oil, indirectly in increased efficiency.

Get full details about Westinghouse Precipitron Oil Mist Control now. Call your local Westinghouse-Sturtevant office, or write Westinghouse Electric Corporation, Sturtevant Div., Hyde Park, Boston 36, Mass.

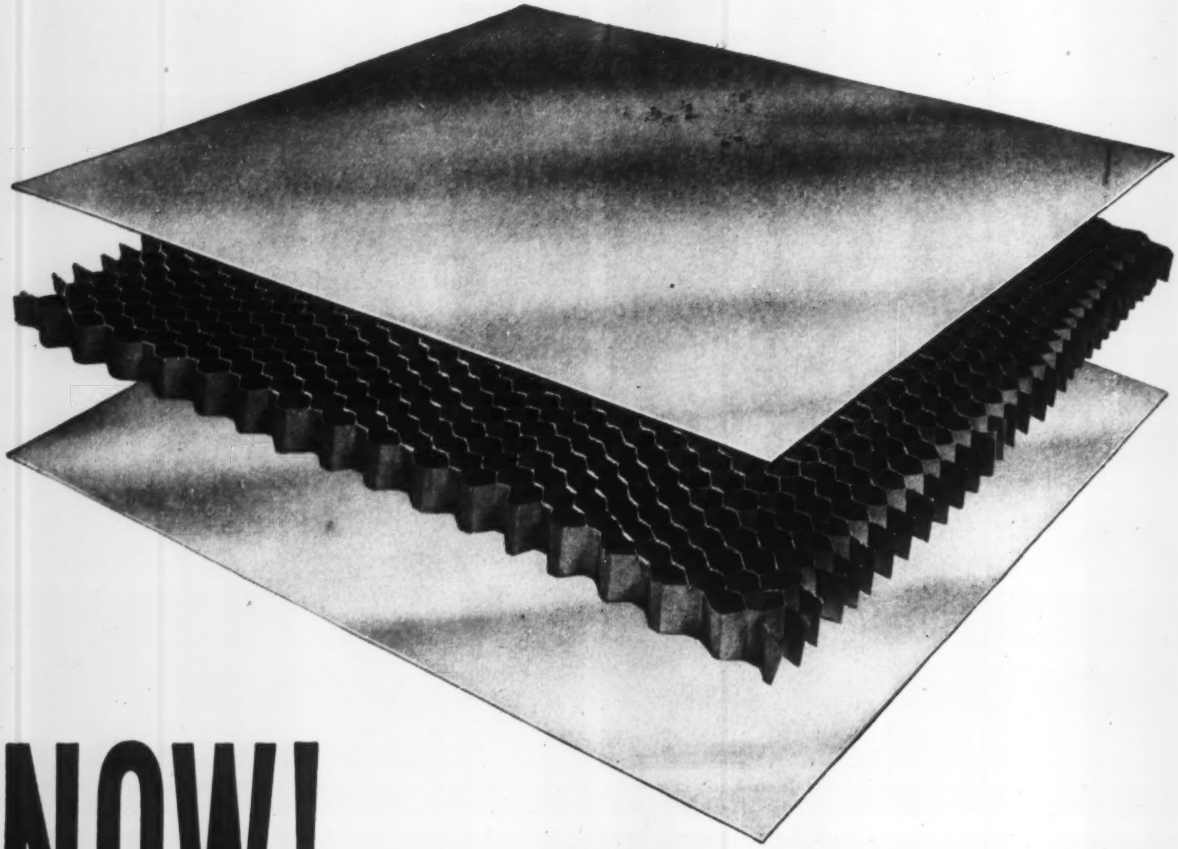


Here's how Precipitron works: Collection hoods catch oil mist at source. Quiet, efficient Westinghouse fan units draw coolant-laden air through Precipitron air cleaners—oil, smoke, fumes are completely trapped. Operating cost: pennies per week.

WESTINGHOUSE AIR HANDLING

YOU CAN BE SURE . . . IF IT'S Westinghouse

J-80423



NOW! Cellular Sandwiches of Stainless Steel for Aircraft

This cellular mat of Armco 17-7 PH Stainless strip is the filler that is sandwiched between two stainless steel sheets to make an aircraft panel.

How It Works

The 2 to 3-thousandths of an inch thick core material, when bonded into panels with adhesives or by brazing, permits the skins or faces of the panels to be stressed to their yield strength without premature buckling. The core carries the shear and compressive loading.

Why It's Strong

Panels have very high strength-to-weight ratio due to their design, and because both filler strip and cover sheets are made of Armco 17-7 PH. This precipitation-hardening stainless steel develops typical tensile yield strengths of 180,000 psi, and even higher *compressive yield strengths*, through double low-temperature heat treatment.

Where Used

The cellular 17-7 PH stainless panel is under development for jets, rockets and missiles because of its great strength at temperatures up to 900 F. Yet it can be used in cold or hot service for tail pipe shrouding, leading edge sections, bulkheads, fins, control surfaces, after-burner cases, and many other applications requiring corrosion resistance, lightness and enduring strength.

Ask About This Stainless

Just write us at the address below and we will send you complete information on the precipitation-hardening stainless steels, Armco 17-7 PH and Armco 17-4 PH.

ARMCO STEEL CORPORATION
4684 CURTIS STREET, MIDDLETOWN, OHIO

SHEFFIELD STEEL • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

October 4, 1954

Agenda for October

In a recent address before the Manufacturers Association of Connecticut, Chairman Benjamin F. Fairless of U. S. Steel issued a timely warning against complacency in regard to socialism. He pointed out that in trying to save ourselves from the communist menace, we are dropping our guard against socialism, "which is equally dangerous to human liberty and has been vastly more successful than communism in its creeping conquest of nation after nation."

Although England and Australia, both ravished by state socialism, have renounced it, the number of really free nations in the world is shockingly small. Mr. Fairless said that "outside of two or three nations here in the Western Hemisphere it would be difficult to find any place on this globe where the philosophy of free, private, competitive enterprise is still dominant."

It may not remain dominant in these remaining few spots unless more thinking people manifest a new awareness of the dangers of socialism. Communism and socialism, says Mr. Fairless, are different enemies being fought on different battle fronts. The responsibility of fighting communism is largely that of the governments of nations, but the fight against socialism can be waged by individuals on the home front.

In fact, the battle against socialism can be fought at the ballot boxes on Nov. 2, less than a month from today. The big issue is whether the voters wish to reaffirm the mandate they issued so overwhelmingly in 1952 to renounce the socialistic objectives of the Roosevelt and Truman administrations.

On the strength of that mandate, the Eisenhower administration has tried hard to reduce the authority of the federal government and to restore more prerogatives to individuals. Progress has been painfully slow because, throughout two decades, the poison of socialism has penetrated so deeply into the national blood stream.

October will be a month of political campaigning. For industrial executives everywhere, pray that it may be a month in which they render their utmost material and moral support, not to candidates because of their Republican or Democratic party affiliation, but because they stand for the principles of free enterprise as against the certain disastrous results of socialism.

E. L. Shaner

EDITOR-IN-CHIEF

MORE THAN EXPECTED: Months ago when steel ingot output began to sag to 65 per cent of capacity or lower, interested producers and consumers attempted to get a rough idea of the amount of finished steel that was being consumed out of accumulated inventory—that is, steel that was not currently being shipped from mills or warehouses. As a result of some fairly intelligent investigation and estimates, the experts decided that something in the neighborhood of 5 million tons of steel was being consumed out of accumulated stocks.

As time wore on and as the steel operating rate continued in the 65-per-cent area much longer than anticipated, steelmakers and steel consumers began to wonder whether that 5-million-ton estimate was accurate. Recently a few of the persons who were somewhat responsible for arriving at that round figure have been doing some extensive rechecking. Now they are convinced that the amount of steel consumed out of inventory was nearer to 10 million or 11 million tons than the 5 million originally estimated (p. 147).

TURNING POINT NEAR:

If the 10 million or 11 million ton figure is reasonably realistic, it would account for much of the uncertainty that has attended the persistent sluggishness of the steel operating rate in recent months. And yet, if we think back to the period of 1951, 1952 and early 1953, we must realize that conditions then encouraged every consumer of steel to seek tonnage far in excess of immediate needs and to hoard tonnage at every opportunity.

We should not be too much surprised to find that consumers actually have been living off accumulated inventory to a greater extent than had been realized. There is consolation and some encouragement in the result of this publication's quarterly survey of components (p. 51), which indicates that inventories on many items will be reaching bottom within the next few months and that soon thereafter the trend will be reversed upward.

DISTORTION BACKFIRES:

Sometimes one wonders just what goes on behind the scenes in political organizations. For instance, why do current issues of the Democratic party's official "fact book" present so much material that is so far to the left of the views held by a majority of members of that party?

STEEL's Washington editor has been examining issues of the fact book. In his opinion (p. 58) it distorts plain facts far beyond any allowance that may be granted because of any conceivable journalistic or political license. Particularly in its treatment of the tax bill enacted by Congress, the liberties it takes with the truth are downright dirty.

This kind of inexcusable demagoguery boomeranged badly when left-wing labor leaders and politicians employed it against the late Senator Taft in Ohio in 1950. Similarly, it probably will backfire in 1954.

SCRATCHING SURFACE:

Sometimes it does no harm and may do good to speculate with almost blue sky freedom about future developments in a certain field. This has been done in the case of materials handling (p. 54) and the panorama thus unfolded is exciting.

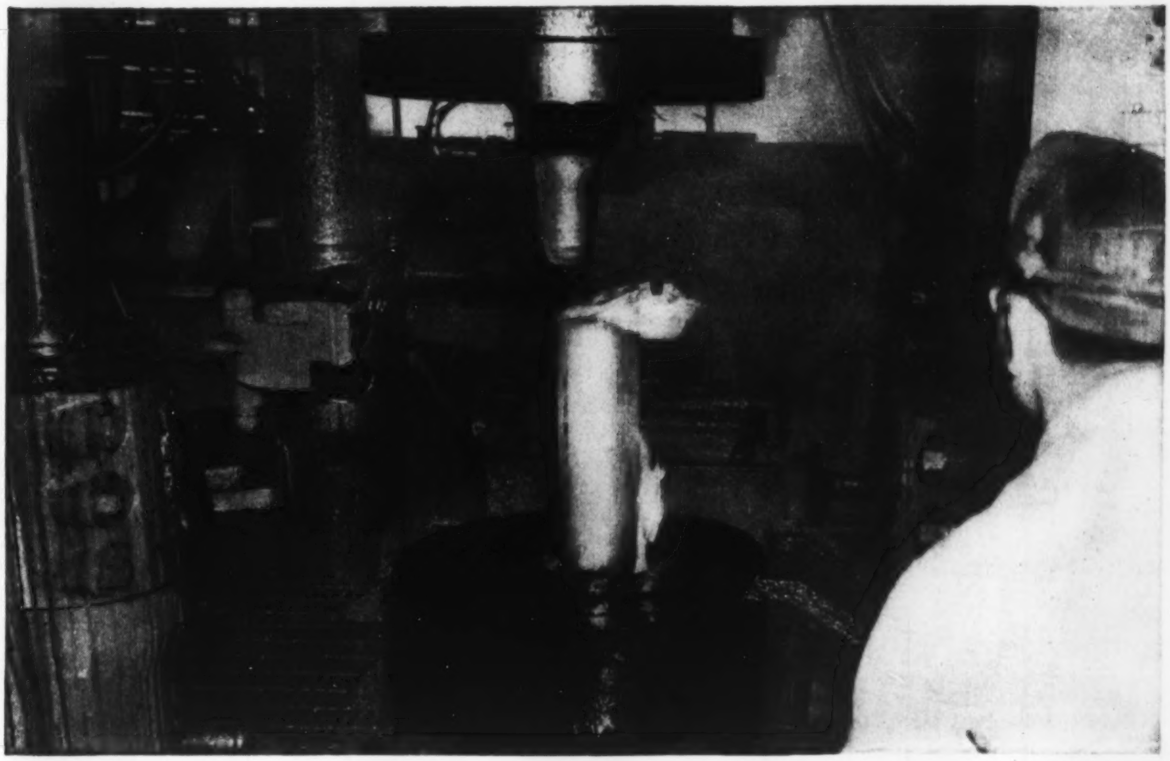
Imagine the nation at some future time when all presently known methods of handling materials, together with many new ones, are developed and extended to limits far beyond any potentials that now seem possible. From that uninhibited viewpoint it is possible to believe sincerely that today we have barely scratched the surface of the uses to which conveyors, belts, pipe lines, tubes, cranes, tramrails, trucks, tractors and similar equipment will be introduced. Also we must be prepared to entertain new ideas as to distances, speed and other factors, which now limit the use of materials handling equipment.

TITANIUM IS HERE, BUT:

By 1956, titanium sponge capacity will hit 22,500 tons. Production is becoming a less serious problem, but two other factors seem to be holding back the commercial exploitation of the wonder metal.

Prices, of course, are still unrealistic, but even this handicap is not too serious. Some people are using titanium. Titanium wire, for instance, is going into anodizing and galvanizing racks. Other promising applications include high-speed mechanical parts for calculating machines and valve trim.

Much of the blame for the slow acceptance of the metal can be pinned on the government (p. 96). In spite of all the scarcity talk you hear, the military is using only about 50 per cent of the output, the wary civilian market only 2 to 5 per cent. The atmosphere of scarcity is a false one.



Die Pot Life Increased 350 Per Cent

A deposit of HASTELLOY alloy C hard-facing rod has more than tripled the service life of the die pots used in this slugging and piercing operation. The hard-faced parts are exposed to severe impact and abrasion at high temperatures. Press tonnages required to perform the operation have been reduced from 30 to 50 per cent since the pots have been faced with HASTELLOY alloy C. This rather unusual plus value is due to the low friction characteristics of this nickel-base alloy.

Resists Chipping and Spalling

HASTELLOY alloy C is a tough, machinable, hard-facing alloy that can be applied to all common die steels. It has high tensile strength, good ductility and excellent resistance to chipping and spalling. It can be applied by the metallic-arc process, flows smoothly, and produces sound deposits. No special heat-treating or cooling procedures are needed.

No Grinding or Peening

When deposited, HASTELLOY alloy C has a hardness of 210 Brinell, and can be machined easily by ordinary die-sinking tools. Then the deposit work hardens, in service, to about 375 Brinell without deformation. Its work-hardening characteristics eliminate the necessity for peening the deposit to obtain maximum wear-resistance.

For information on procedures for applying and for available sizes and prices, write for the booklet "HASTELLOY Alloy C—A Machinable Hard-Facing Alloy."

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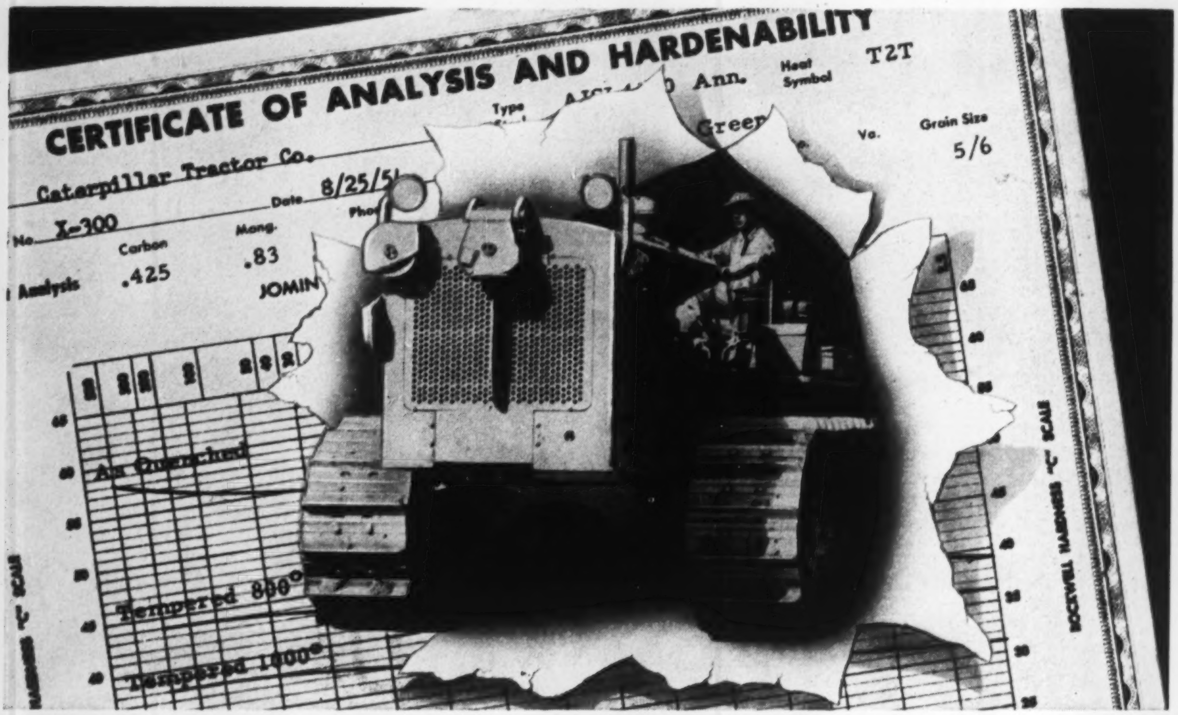

CERTIFICATE OF ANALYSIS AND HARDENABILITY

Caterpillar Tractor Co.

Date 8/25/5

No. X-300

Heat Symbol T2T

Ann.

Green

Grain Size 5/6

Carbon .425

Mang. .83

Analysis

JOMIN

As Quenched

Tempered 800°

Tempered 1000°

ROCKWELL HARDNESS "C" SCALE

Caterpillar® quality control inspires Ryerson certification

It was 1935—Caterpillar pioneering in quality control—was concerned about the uniform quality of alloy steels from warehouse stock.

Ryerson wished to serve its customers in the best possible manner. We sent our metallurgists to Caterpillar and asked them what could be done that wasn't being done.

Caterpillar pointed out that in the heat treatment of parts there can be as much difference in behavior between two mill heats of the *same* type composition as between two heats of *different* type composition. To emphasize this fact, they cited a statement in the AISI Manual that it would be false and misleading to assume all steels of a given composition are the same.

Ryerson accepted the challenge and began laying the groundwork for a quality control program which would include—1. selecting mill heats, 2. spark testing and carefully segregating every heat, 3. identifying each heat by heat symbol, 4. color marking for AISI number, 5. testing for hardenability in our own laboratory, 6. interpreting hardenability, 7. final inspection before shipment, 8. furnishing Certificate of analysis and guide to heat treatment.

After two years of preparation—we announced the Ryerson Certified Alloy Steel Plan in 1937. And now—not only Caterpillar but all other alloy steel users can buy high uniform quality alloys from Ryerson warehouse stocks with complete confidence. The plan takes time and money but has been helpful to Caterpillar—and we believe—even more helpful to companies without the elaborate testing facilities of Caterpillar Tractor Co.

It just happens that Ryerson is one of four companies that have been serving Caterpillar since their founding—so we are particularly happy to tell this story of progress in quality control—inspired by Caterpillar on this, their 50th anniversary of service to America and to the world.

Principal products: Bars, structurals, plates, sheets, tubing, alloys, stainless, reinforcing, machinery, & tools, etc.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Industrial Components

CONSUMERS TELL WHAT'S HAPPENED IN THE LAST THREE MONTHS

STEEL'S QUARTERLY SURVEY

BETTER

- Antrifriction bearings
- Belting, belt drives
- Die castings
- Gray iron castings
- Malleable castings
- Nonferrous castings
- Steel castings
- Fasteners
- Elec. motors (over 5 hp)
- Screw machine products
- Springs, wire shapes

SAME

- Hose couplings
- Air, hydraulic cylinders
- Electrical equipment
- Forgings
- Gears
- Elec. motors (fractional)
- Elec. motors (1-5 hp)
- Mechanical rubber goods
- Stampings
- Weldments

WORSE

Inventories on the Mend

Only a quarter of respondents plan further reductions. Most look for better business in the coming quarter. Almost all expect to be in good shape by year end

STEEL's latest survey of industrial components has the expected fall upturn arriving on schedule. Straws in the wind: Inventories are substantially lower, strongly indicating they are at last coming into line. Better news yet is the intention of many survey respondents to increase inventories in the coming quarter.

Reinforcement is offered by some respondents who report that in spite of higher inventories they are in a better business position now than at the start of last quarter. This, in turn, strengthens indications that higher inventories are coming back in vogue.

Caught Short—For example, on about half of the components surveyed, fewer firms reported supplies of less than 10 days than did last quarter. (Of course, fewer are in the 60-90-day and 3-6-month class, too.) Some respondents admitted that they let stocks get too low, but they're taking corrective action. Model changeovers caused some to pare stocks, and they, too, are coming back into the market.

There are also signs that a chain reaction is just around the corner. Some firms are holding in delayed delivery status orders that were placed before the downturn last year. When customers call for delivery, suppliers will almost automatically be in better shape.

Snags—Delivery on most components is good, though there are exceptions. Short-run stampings, screw machine products, forgings and steel castings are annoying some users. On the other hand, deliveries of some normally long lead time specials are reported to be excellent.

On inventories the main troublemakers are antifriction bearings, forgings, stampings, electrical equipment and fractional horsepower electric motors.

More Slicing—Some respondents have taken the easy delivery situation as a signal to reduce stocks further. They say if delivery continues to improve, they'll chop inventories even more.

The longer-term outlook shown by the survey is even better than the immediate picture. Almost 50 per cent of the respondents expect their inventory position to be better in three months. Less than 4 per cent think it will be worse. Pointing up predictions that the upturn will be gradual are the 47 per cent who expect no change in fourth quarter.

Going Up — Higher component stocks definitely are on the way for 22 per cent of the respondents. About 26 per cent expect stocks to be lower, and 52 per cent predict they'll stay about where they are.

Of those planning higher inventories, 83 per cent expect to be in better business health at the start of 1955. Only 11 per cent are pessimistic. The remaining 6 per cent see themselves in the break-even bracket.

Improvement—In the group that forecasts lower stocks in three months, 81 per cent say that means they'll be better off. Only 5 per cent take the glum outlook, and 11 per cent suppose they'll be about where they are now.

Among those who look for no

changes in their inventories through the quarter, 19 per cent say they'll be better off at its end. The remaining 81 per cent are looking for a continuation of today's conditions.

The survey places present stocks of most items in about 30-day supply, on an average. On longer lead time items, though, inventories tend toward a 60-day supply.

Machine Tool Orders Increase

Business weather forecasts for machine tool builders are brightening.

New orders in August were about $43.3 million, up from $36.5 million in July, and incoming September orders, according to some builders, indicate that the month may hit the year's sales summit.

Tool builders report that since the new tax bill became effective, permitting faster depreciation allowances, the number of inquiries has increased sharply.

National Machine Tool Builders' Association, Cleveland, pegged its preliminary August order index at 147.0, compared with July's 124.7. Index is based on 1945-1947 business. Backlogs average about five months.

Equipment People Sharpen Sales Tools

Many of them are reviving old or adopting new deferred payment plans. Laws permitting faster depreciation make 1-to-3-year pay plans attractive

DEFERRED PAYMENT plans don't stimulate equipment buyers like the "dollar down" TV ad does a baseball fan at world series time. But they help.

More and more equipment makers think so. So do buyers who haven't got the ready cash to make an outright purchase.

The Terms — A typical plan works like this: From 25 to 33 per cent down, 12 to 36 months to pay the balance, interest charges as low as 4 per cent, but averaging about 6 per cent simple interest.

"Deferred payment plans are not new," say officials of National Acme Co., Cleveland. "We've had the plan for 40 years. But the new tax law permitting faster depreciation on equipment is stimulating more interest in the payment plans."

The Competition — Other tool builders are using deferred payments as a competitive weapon against leasing (see STEEL's leasing series, starting Mar. 29, p. 67). Faster depreciation allowances under the new tax laws will make equipment purchasing more attractive than leasing, say the deferred payment advocates:

1. Interest costs on deferred payments are tax deductible as operating costs.
2. Tax laws often permit the write-off of a major part of the equipment cost during the payment period. (Under the sum of the digits provision, up to 72 per cent of the cost can be written off in the first half of the equipment's life.)
3. In deferred payment plans, there's no ambiguous tax situation that exists under leases with purchase option clauses.
4. Outright purchase under deferred payments gives the buyer all the prerogatives of ownership not possible under leasing arrangements.

The Financing—Some tool builders like E. W. Bliss, Canton, O., have deferred payment plans set up in co-operation with financing institutions. Down payments are made to Bliss and monthly payments to the financing firm.

Other companies like Motch & Merryweather Machinery Co. and Hill Acme Co., Cleveland, carry their own financing paper.

"We're not banking or financing firms," the companies state. "And most of our business is done on a 30-day cash basis. However, for the 5 to 8 per cent of the buyers needing the deferred payment service — they're usually the smaller companies—we can generally work out a plan to fit their needs."

Westinghouse Is Optimistic

Sales and earnings of Westinghouse Electric Corp. will continue high for the rest of 1954, predicts Gwilym A. Price, president of the company. Westinghouse hopes to surpass its 1953 sales record.

Mr. Price also expressed opti-

Tractor Shovels Get Auto Assembly Line Treatment

Automotive know-how at Clark Equipment Co., Buchanan, Mich., speeded production of a new line of "Michigan" tractor shovels. Ranging in size from 15 cubic feet to 2¼ cubic yards, the units are driven by a torque converter transmission power train developed and produced by Clark's Automotive Division mism for the outlook in 1955-56. "The combination of backlog, plus a stabilized rate of incoming orders, should not mean a serious decline in heavy apparatus lines . . . the rate of consumer expenditures for durables will be relatively strong for the next two years mainly because of such factors as population increase, a stabilized economy, a high rate of home building and increased consumer purchasing power."

Westinghouse is aiming at increasing its over-all market position by about 25 per cent by 1957. To accomplish that goal, the company plans a $300-million expansion program scheduled for completion in 1955; intensified research, engineering and product development; expanded sales efforts; and broader emphasis on management development and incentives.

Used Machine Tool Sales Down

Sales of used machine tools reported by the Machinery Dealers National Association are down substantially from last year. But the rate of decrease is slowing down this year.

First half, 1954, sales of used machine tools were $11,043,740 compared with $14,441,986 for first half, 1953—off 23.5 per cent. Second quarter, 1954, sales were $5,432,927 compared with $6,833,260 for second quarter, 1953—off 20.5 per cent. But second quarter, 1954, when compared with first quarter, 1954, sales of $5,610,813, were off only 3.2 per cent.

Western Metal Show Announced

The ninth Western Metal Exposition sponsored by the American Society for Metals and 19 other technical societies will be held March 28 through April 1, 1955, in Pan-Pacific Auditorium, Los Angeles.

Along with the show, the Ninth Western Metal Congress will take place in the Los Angeles Ambassador Hotel. Technical programs, roundtables and question-answer periods will be conducted by technical societies devoted to the production, treating, machining and fabrication of metals.

"Modernize To Survive"—Steel Engineers

Industrial expansion is tapering off, but there's plenty of modernization to be done. Materials handling equipment and electronic drives and controls will pace '55 sales emphasis

ALL the excitement in Cleveland last week wasn't World Series play.

Sparks of competition flew hot and heavy at the Iron & Steel exposition, too. Some 200 equipment builders and suppliers, taking their cue from the convention theme of the Association of Iron & Steel Engineers—"Modernize to Survive"—vied for their share of what looks like another $1.5-billion sales melon in 1955.

JOHN J. VOHR
. . . heads AISE in '55

Sales Total—While their steel operating brothers were extracting the meat from a 48-paper technical program, equipment men analyzed next year's market thusly: Some $800 million will be spent on ordinary maintenance, repairs and replacement. This figure varies but slightly from year to year.

The remaining $700 million is the area of contest. With no major expansions in prospect, this expenditure represents vital modernization. Each equipment builder is out to sell producers the idea that his is the important area of modernization.

"Rigger Mortis"—Best tipoff to the character of the selling job done at the show was the lack of gimmicks in the booths. If they could squeeze it through the doors, exhibitors had the genuine article to show the 15,000 who streamed through Cleveland's Public Auditorium during the four-day convention-exposition. Expensive working models substituted for the real thing where size was completely prohibitive.

"See that ignitron power center over there?" one veteran exhibitor pointed out. "Weighs nearly 10 tons and we squeezed it in with only 2 inches to spare. You don't go to the expense of bringing in stuff like that unless it pays off in the profit column." An interesting sidelight: Professional riggers racked up record overtime bills setting up such items as a complete oxygen plant, the biggest shot blaster ever built by its designer and 10-foot-high control panels.

Materials Handling High—Again conspicuous by its emphasis, materials handling came close to dominating the showgoers' attentions. Even builders of conditioning and treating equipment constructed a large part of their sales pitch around handling savings.

Running a close second, both at the show and in the technical sessions, was the interest in electrical drives and controls. As one exhibitor pointed out: "Electronic and electromagnetic control systems are the only means of survival for the operators who are caught in the current quality race.

New Officers—New AISE president is John J. Vohr, general superintendent, Gary Works of U. S. Steel Corp. He'll be assisted by: W. H. Collison, assistant superintendent, blast furnace division, Great Lakes Steel Corp., first vice president; J. D. O'Roark, assistant manager, department of service and maintenance, Weirton Steel Co., second v.p. Treasurer is Leonard Larson, chief engineer, Republic Steel Corp., Cleveland district.

Parts await police escort at Pittsburgh Steel Foundry

Two Castings Too Big To Carry

TRANSPORTING a blast furnace bell and hopper posed some knotty problems for Great Lakes Steel Corp. early last month. Part of a wall had to be torn away at Pittsburgh Steel Foundry Co., Glassport, Pa., where the parts were cast, to get them out of the building. From there, transporting via railroad flat cars was ruled out. Tunnel and bridge clearances along the route would have made the movement difficult and round-about. So the parts were shipped by highway under police escort during early morning hours of minimum traffic to Erie, Pa., where they were loaded aboard a freighter. Cranes lifted them from the hold of the ship and deposited them on the dock at Zug Island (Detroit).

Cranes lift the 35-ton bell from the freighter at Zug Island

Dreams Can Pay Off

Industry needs men of vision with their feet on the ground, says materials handling man

UNTIL the guaranteed crystal ball comes along, management will gladly settle for a staff of sound dreamers.

Men who "can take a dream or a Rube Goldberg idea, trim it down to a practical piece of equipment, a successful application or process by which we all benefit" are vitally necessary, asserted Otto Svoboda of E. W. Buschman Co. in a speech before the Material Handling Institute on Sept. 23.

Dreams Come True—Examples of "dreams come true" are legion in the materials handling field. Immediately coming to mind are the Jersey City moving sidewalk, air-tube bulk materials handling systems, automatic handling of radioactive materials in atomic plants and rotating cable trolley conveyors for parts drying.

While the longest conveyor system in the U. S. is being built in a potash mine in Carlsbad, N. Mex., its 7¼-mile length and 15 miles of rubber belt pale into insignificance beside some of today's dreams.

Future Fantasy—Perhaps one day railroad tracks between such busy centers as Detroit, Cleveland, Chicago, St. Louis and Cincinnati may be paralleled with conveyors. A package traveling at 350 feet a minute would make the Cleveland to Detroit trip in 48 hours. There is talk of a belt conveyor between Pittsburgh, Youngstown and the Great Lakes to handle ore, coal and other bulk products.

Maybe one day your wife will go to the supermarket, make her selections on a pushbutton board and have her packages delivered and bundled automatically to the checkout counter.

Similar plans are feasible for coordinating stockroom with production line, product storage and delivery bays.

Conveyors mounted on a single column at the street curb would greatly improve local city transportation. Operation would be quiet, congestion would be elimin-

In Dollars

ated, and passengers would never have to wait.

But dreams have their dollars and cents side, too. Cost accounting alone, according to Mr. Svoboda, will drive us on to greater efficiency, continued design improvement of handling equipment and a wider range of applications.

Pallet Sizes and SIPMHE

Packing and handling engineers say pallet standardization is fine, but it'll take time

RECOGNITION of the pallet size standardization problem, but no recommendations.

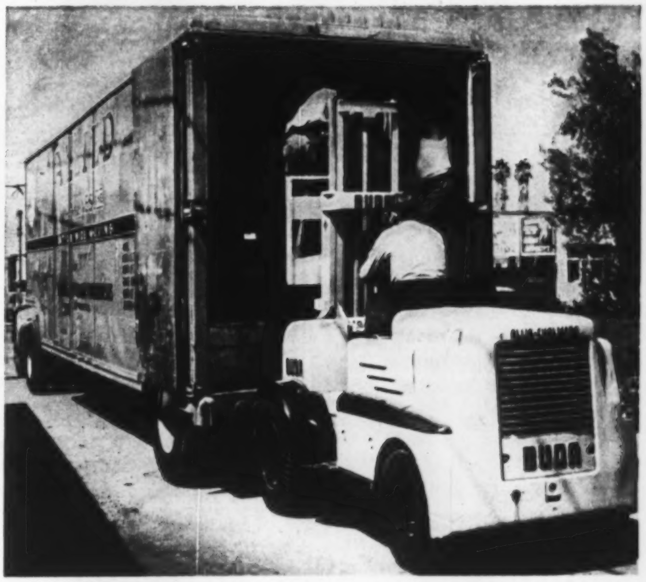
That was the treatment afforded the industrial pallet at Society of Industrial Packaging & Material Handling Engineers convention in Chicago last week. Officially, the society is optimistic about the future of pallet standardization, but members attending the discussions agreed that the project will be a dreary one.

For Growth—Significant, however, is SIPMHE's part in the standardization picture. It's the type of problem that's meat for the growth of the young organization now gaining momentum as a group to serve professional handling and packaging engineers.

Postwar inspired, the society has grown to 1700 members. Fostering the early growth were men like R. Frank Weber, former materials handling director at International Harvester Co. and now a handling consultant, and George Daubert, president of Nox-Rust Co.

Education Function—The society has stayed pretty much on an educational basis. Size of the annual exposition remains about the same—between 90 and 100 exhibitors. But attendance at fundamentals of packaging and handling sessions continues to grow.

Even at the exposition, the accent is a little different. Competition in different classes and types of packaging gives it a bit of a county fair flavor. But entrants produce some top ideas. For example, a winner last year was the fiber drum for packaging and handling wire products.

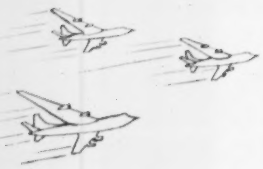


One of the five exhibit-laden vans now touring the country

Air Power for the Next Decade

LOOKING AHEAD a decade, Curtiss-Wright Corp., Wood Ridge, N. J., has prepared an exhibit to give the U.S. a glimpse of a cross-section of what is a top industry in such states as California. Now speeding on its transcontinental journey in a fleet of five truck-trailer vans, this educational display features aircraft engines under development or in production at Curtiss-Wright—the Turbo Compound, the Ram Jet, the Rocket and others. Cut-away models, charts and plastic displays are used to explain the fundamental principles of these engines. Also on display is a flight duplicator that reproduces flight characteristics of a twin-engine aircraft. It contains the basic controls, instruments, responses and navigation aids found in today's aircraft.

A Turbojet engine waits to be loaded aboard one of the vans



Consolidated Vultee Aircraft Corp

Aircraft Outlook: Ceiling Unlimited

Technical developments plus defense requirements keep the aircraft industry flying high. Jet planes, guided missiles and atomic power brighten the prospects

THE RAPID PACE of new developments in the aircraft industry is as spectacular as its high-flying production rate.

For the first time in history, more jet aircraft than piston-engined planes were produced in this nation last year. Guided missiles, too, are getting increasing emphasis. At least 26 different models are being worked on, according to Aircraft Industries Association of America Inc.

The Figures—Sales for the 12 leading aircraft companies in 1953 hit $5.1 billion, a figure topped only in the war years of 1943 and 1944. And with unfilled orders currently amounting to about $11.6 billion, prospects continue good. Here are some reasons why:

1. Every fighter plane in combat units of the Air Force today is jet propelled, 23 wings of the Air National Guard are virtually 100 per cent jet equipped, and a large percentage of bombing wings are following. Because higher speed and altitude operations shorten plane life, this assures the industry of an important replacement market, in addition to new plane sales.

2. At least 44 major industrial and scientific organizations are at work on prime contracts for guided missiles. At the beginning of this year, contracts totaling over $1 billion were held by the industry, and the administration is seeking additional defense funds for work in connection with guided missiles.

3. American-built aircraft continue to dominate world markets. Aircraft Industries reports that industry exports in the seven-year period ending last year amounted to $2.5 billion, with nearly $294 million of that going to civil aircraft sales. Chief foreign markets include Canada, Netherlands, France and Argentina.

Flying Atoms — Brightening the industry's outlook picture, too, is the prospect for nuclear-powered aircraft. H. L. Hibbard, vice president of engineering, Lockheed Aircraft Corp., predicts that military aircraft will be nuclear-powered within ten years. Eight companies are currently studying atomic possibilities for aircraft.

Defense expenditures remain the backbone of the aircraft industry. But unless world conditions change, these expenditures are expected to begin tapering off next year. To meet this exigency, procurement officials are trying to plan a long-range program to level high-cost peaks and valleys. Looking to their own future, many in the industry are diversifying, mainly to the electronics and atomic energy fields (see STEEL, June 21, p. 84).

Speed Up for Railway Express

Railway Express Agency Inc. will speed its service through purchase of 3000 new 1½-ton trucks. Costing $9.5 million, they will be in service before the end of the year, says A. L. Hammell, president of Railway Express.

This is part of a six-year replacement program; thousands of the company's 13,500 units will be retired. Loans for purchase of the equipment will be repaid during the life of the equipment.

Truck chassis are being supplied by Fargo Motor Division, General Motors Corp. and International Harvester Co. Special truck bodies will be supplied by Gerstenslager Co., Wooster, O.; York-Hoover Body Corp., York, Pa.; and Metropolitan Body Corp., Bridgeport, Conn., subsidiary of International Harvester.

Atoms at the Crossroads

Studies are under way to help industry decide how best to use nuclear energy. The problem is here

WHICH WAY will the atom go in civilian usage and how will it get there?

Resources for the Future Inc. (Ford Foundation-backed research group in the field of natural resources) is putting up $200,000 to get the answer. National Planning Association will provide the researchers for the two-year project.

Best Bet — The study will be aimed primarily, but not exclusively, at the economic implications of electric energy from nuclear reactors.

Five angles will be explored: The national interest (How important is it to get nuclear fuels?); the interests of U.S. regions (What is the demand for nuclear fuel generated electricity?); industry's interests (What are the anticipated needs of selected industries for atomic energy?); government-business relations (What are the respective roles?); and international needs and problems (What are the potential economic effects of nuclear power abroad?).

Only Hope — The RFF-NPA study will draw upon the views of specialists in the field of atomic energy. One of them, Francis K. McCune, general manager of the General Electric Atomic Products Division, says:

"Only by our taking immediate action to put atomic energy to economic use can tomorrow's economy hope to survive without the need for jarring adjustments." Mr. McCune believes only nuclear fuels can supply the tremendous energy needs of tomorrow; the fossil fuels (coal, oil and gas) ultimately will become the raw materials of the chemical industry.

Still another group, Atomic Industrial Forum Inc., has announced plans for detailed studies of several atomic energy problems facing industry: Health and safety problems; construction and operation of industrial reactors; estimates of materials, equipment and skills required in atomic energy over the next 5 to 10 years; insurance problems; problems that may result from AEC licensing and patent practices; and giving industry nonmilitary atomic information.

All projects make the point: Atomic problems for industry are here today; they're not for tomorrow.

New Atom Act Assessed

The New Atomic Energy Act is a long step in the right direction, said John W. Landis, Babcock & Wilcox Co., at an Atomic Industrial Forum Inc. meeting in New York last week.

The statement summarizes the thinking of some 500 businessmen and industrial research experts who gathered to discuss: "The New Atomic Energy Law—What It Means to Industry."

Mr. Landis anticipated no overnight transition to nuclear power. Even the most optimistic do not foresee more than 20 per cent of total electric energy coming from nuclear fuels before 1975, he said. Arthur V. Peterson, American Machine & Foundry Co., prophesied that within the next decade the gross annual private investment in research activities will match that of the government.

Everett L. Hollis, General Electric Co. and former general counsel for the Atomic Energy Commission, declared a full appraisal of what industry can do under the new act cannot now be made. That, he said, must await issuance of the detailed AEC regulations and accumulation of some administrative experience of the law.

Seatrains Getting Closer?

A deal by which the government would help development of seatrain services on the East Coast is under way, according to indications given by Army Secretary Robert T. Stevens at the National Defense Transportation Association meeting in St. Louis.

Three projects now being worked on call for "roll-on, roll-off" type ships for handling trucks. Fast write-off is being sought in all three cases, government loans in two.

For details of the pending seatrain plans, see STEEL, Feb. 22, p. 54.

New Mill Starts Operation

Allegheny Ludlum completes $96-million postwar expansion, modernization program

PRODUCTION started last week in Allegheny Ludlum Steel Corp.'s new tandem cold-rolling mill at the Brackenridge, Pa., plant. It marked the completion of a $96-million, 9-year modernization and expansion program at Allegheny Ludlum.

The new four-stand mill makes it possible for the company to offer regularly to the trade 48-inch-wide coils of cold-rolled electrical and stainless steels. Included in the mill is complete auxiliary equipment for continuous annealing, pickling and shearing.

Conversion — In keeping with the industrywide trend, Allegheny Ludlum has placed much of its postwar expansion and modernization emphasis on converting its production from sheets to coils. Completed in 1951 was a 56-inch single-stand reversing cold mill adapted to the company's production of stainless steel coils.

The new four-stand mill is especially suited for longer production runs and will be particularly useful in producing silicon steel.

Mesta Machine Co., Pittsburgh, built the mill and General Electric Co. provided the major electrical and control equipment. Rolling capacity of the mill is 300,000 tons of stainless, silicon and alloy steel annually.

Fourth Cut in Four Years

Due to reduced appropriations, the Bureau of Apprenticeship of the Labor department has ordered the closing of 31 field offices and the dismissal of 47 staff members, including 22 field representatives. This makes four reductions in as many years for the Bureau of Apprenticeship.

Four years ago the bureau had a staff of 605 of which 540 were in the field; now it has 485 of which 420 are in the field.

Efforts are under way to get states with field staffs—like California, New York and Minnesota—to take over apprenticeship work previously handled by the federal government.

Democrats Issue '54 "Fact" Book

FROM THE STANDPOINT of many businessmen, the new "1954 Democratic Fact Book," distilled from the speeches of such powerful medicine men as Harry S. Truman, Adlai E. Stevenson and Walter P. Reuther, is one of the most distorted documents to come down the pike in a long time.

The 96-page book has chapters on Taft-Hartley, foreign policy, national defense, public power, farm problems, "giveaways," housing, veterans' affairs, "broken promises," etc. Contents are not necessarily consistent.

Amusing, But—Possibly many inconsistencies are considered amusing but harmless. But that may not be the case when "the book" analyzes and criticizes the 1954 tax revision act.

It ignores the fact that most tax changes enacted in 1954 were intended to provide greater incentives to industry—particularly to encourage more private savers to invest their money in industry and thus expand business, create more jobs. The "fact book" overlooks the fact that the highly progressive income tax rates—up to 91 per cent—are still with us and continue to divert to the tax collector many millions of dollars which used to be invested in industry.

Facts On Tax—The "fact book" says this about tax relief: "Under the GOP bill, corporations will get 73 cents, families earning more than $5000 will get 18 cents and the under-$5000 group, 9 cents."

HERE'S HOW TO COMPUTE DIVIDENDS RECEIVED

Married person—two dependents						
1. Income	$3,000	$4,000	$5,000	$10,000	$20,000	$50,000
Less:						
2. Dividend exclusion	50	50	50	50	50	50
3. Deductions (assumed to be 10% of Line 1)	300	400	500	1,000	2,000	5,000
4. Exemptions	2,400	2,400	2,400	2,400	2,400	2,400
5. Taxable income	250	1,150	2,050	6,550	15,550	42,550
6. Tax before dividend credit	50	230	410	1,361	3,785	15,948
Assuming 50 percent income from dividends						
7. Dividend income after exclusion	1,450	1,950	2,450	4,950	9,950	24,950
8. Dividend credit (4% of Line 7 or Line 5, whichever is less)	10	46	82	198	398	998
9. Tax after dividend credit (Line 6 minus Line 8)	40	184	328	1,163	3,387	14,950
Assuming 100 percent income from dividends						
10. Dividend income after exclusion	2,950	3,950	4,950	9,950	19,950	49,950
11. Dividend credit (4% of Line 10 or Line 5, whichever is less)	10	46	82	262	622	1,702
12. Tax after dividends credit (Line 6 minus Line 11)	40	184	328	1,099	3,163	14,246

Note: Tax is computed at 1954 rates, and all dividends are assumed to be received by one spouse.

The book ignores the fact that the public pays corporate taxes.

The "fact book" also charges that the dividend receiver gets a better tax break than the wage and salary earner under the new tax act. It says:

"One of the biggest tax bonanzas in the GOP tax bill is the huge relief proposed by the Eisenhower administration for corporation shareholders. To show you how this works, take two families, each with two children, each receiving $5000. One is a worker at U. S. Steel; his $5000 is earned by working an open-hearth furnace eight hours a day. The other is a U. S. Steel stockholder; his $5000 is merely mailed to him in the form of U. S. Steel dividends. Under the Eisenhower proposal the U. S. Steel worker pays $420 in taxes and the U. S. Steel shareholder pays $200 in taxes."

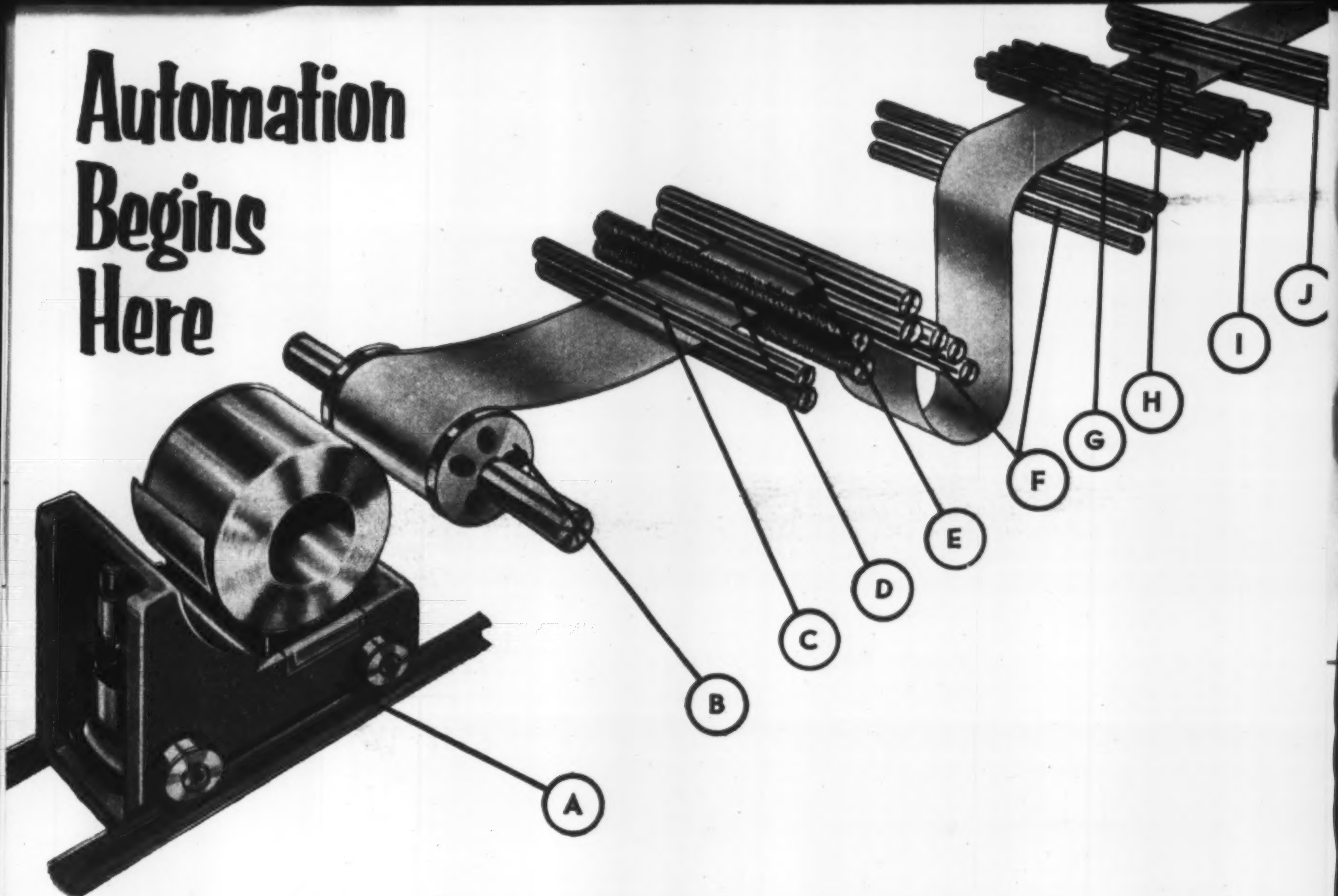
Tax Takes Two Bites . . .

The argument overlooks double taxation of dividends—the abuse that all the shooting was about. The "fact book" ignores the fact that before an investor gets a penny in dividends, the corporation has paid the 52 per cent tax on its earnings. The dividend receiver pays a tax on top of this.

Balance — The accompanying table shows how the liberalized tax treatment of dividends under the new law substantially benefits the small investor; the receiver of dividends up to $100 is exempted completely. The table shows how the benefits taper off progressively and rapidly as the total dividends increase. Relief to those investors who furnish most of the risk capital is small.

Aside from its antibusiness bias, and its attempt to offer benefits to minority groups with mass voting power (it tells veterans that "Eisenhower interest rates mean one less bedroom in GI homes"), the striking feature of the "fact book" is the emphasis it places on an alleged need for bigger government spending programs. No worry is expressed as to what spending will do to taxes, public debt and national solvency.

Automation Begins Here



utomation—the automatic handling of work in ocess — permits manufacturers to combat high bor and material costs by boosting man-hour oduction. McKay has played a large part in this ovement by designing and building "automated" uipment for the automotive and steel fabricat- g industries.

r example, coil feed lines of the type illustrated ove were designed and built by McKay for sev- al leading automotive firms. They are used to tomatically feed coil stock into square shears blanking presses, thus eliminating inefficient d laborious methods of manually feeding these achines.

TYPICAL LINE EQUIPMENT

(A) Hydraulic Loading Car for stand-by coil.

(B) Cone Type Coil Holder handles wide range of coil I.D.'s and O.D.'s.

(C) Guide Rolls to direct strip into brush rolls.

(D) Brush Rolls with solvent sprays to clean strip.

(E) Driven Pinch Rolls for pulling coil stock and filling storage loop.

(F) Guide Rolls to support loop.

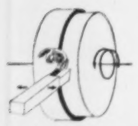
(G, I, J & H) Feeder unit consisting of Backed-Up Leveler **(G-I)** and pinch rolls **(J)** is powered by D.C. drive which is controlled by a measuring device driven from measuring rolls **(H)**. The feeder flattens the strip and accurately measures it into open press dies or through shear knives.

Line operation is synchronized with the press or shear for maximum production. McKay builds these units with design, speed, and capacity dictated by your job requirements.

he Mc KAY MACHINE *Company*
YOUNGSTOWN, OHIO

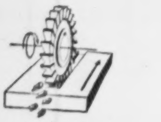
Mc·K

ENGINEERS AND DESIGNERS OF
EQUIPMENT FOR THE AUTOMOTIVE,
FABRICATING AND STEEL INDUSTRIES

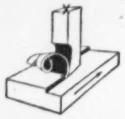


THE ENGINE LATHE uses a single-point tool restricted to chip-producing operations on the exterior surface of a rotating workpiece.

THE DRILL PRESS uses a revolving tool restricted to chip - producing operations penetrating into a fixed workpiece.

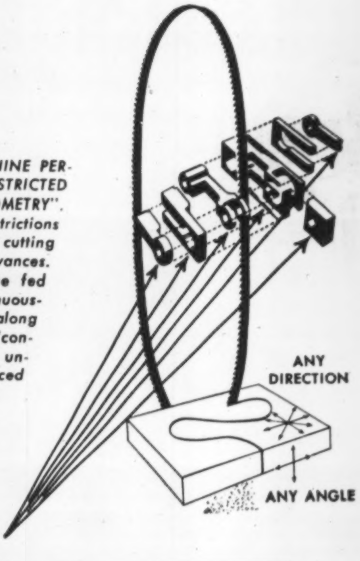


THE MILLING MACHINE uses a rotating cutter held in fixed position restricted to chip-producing cutting operations as workpiece advances.



THE PLANER employs a single-point tool restricted to chip-producing, straight-line cutting on a plane surface as workpiece advances.

THE BAND MACHINE PERMITS "NON - RESTRICTED MACHINING GEOMETRY". There are no restrictions to the direction of cutting action as the cut advances. Hence, work may be fed to the narrow, continuous-cutting band tool along either a straight or "contoured" course. And unwanted material is "sliced off" in whole sections.



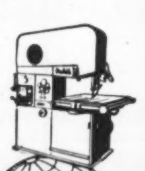
How the "non-restricted Geometry" of band machining can cut your costs!

Slotting operation on production parts being performed on DoALL Band Machine at half the cost of milling, the previous method used.

With modern DoALL Band Machines you can cut costs in slotting, splitting, cutting contours, cutting parts from the solid, notching and many other operations—*on a high production basis.* Here is why:

- New blades of high-speed steel provide revolutionary new production rates.
- The thin blade "slices" through metal, removing an entire section intact instead of whittling it down to a pile of chips.
- Straight cuts with good finishes can be made accurately at any angle to the face of the workpiece.
- Any internal or external shape or contour can be cut.
- Work is mounted on a tiltable table which feeds automatically by hydraulic power.
- A new built-in coolant system is employed with these new "red heat hardness" production band tools.
- Infinitely variable feeds and speeds provide optimum results on any job.
- There is a cutting tool for every job and every material including new DoALL *Demon high-speed steel* saw bands that cut up to 5 times faster and last up to 30 times longer than any previous saw band.

For a demonstration, call your local DoALL Store, or write:
The DoALL Company, Des Plaines, Illinois.



DoALL

Band Machines, Saw Bands, Precision Surface Grinders, Precision Measuring Equipment, Black Granite Surface Plates and a Complete Stock of Cutting Tools at each of 38 DoALL Sales-Service Stores. Call DoALL.

PB-8

Free: New wall chart "How Basic Tools Created Civilization." Make request on your company letterhead.

Hydropress Inc.

More goods will be seen abroad by more people as . . .

U.S. Business Goes to the Fairs

The Commerce department may ask you for your foreign fair-going plans for 1955. It's part of a new effort to sell the U. S. while selling U. S. products in foreign countries

AMERICAN BUSINESSMEN are giving a lot of thought to fairs. Not the U. S. variety, but foreign trade fairs, a real marketing institution in many overseas countries.

Dual motives are at play: For one, participation in foreign trade fairs makes good economic sense. When in Rome to sell, it pays to go where the buying Romans congregate. Secondly, our Commerce department and other government agencies are backing better U. S. attendance, plus a more concerted effort, at world trade fairs. Some $5 million in special funds were signed over to these purposes last month by President Eisenhower.

Old World—Many manufacturers in foreign countries, particularly in Europe, rely on the trade fair as the most effective means of reaching the greatest number of consumers and commercial buyers. The Paris International Fair last year attracted 3.5 million people; this year's fair at Milan brought in 4.5 million people.

Other fairs held regularly in Berlin, Brussels and Hanover each consistently have over a million in attendance. And the business transacted at each ranges from a few million to over $100 million.

Lighter Touch—American businessmen are finding out for themselves that it pays to attend these European fairs. In contrast to previous years, American products were displayed by 571 exhibitors at the Milan fair this year. But the Russians also had discovered the trade fairs were an excellent propaganda vehicle for their "more trade" line. The Russian bear— in the form of gentlemanly, smooth-talking salesmen—dominated several trade fairs earlier this year.

So the Commerce department has arranged to survey American businessmen for their 1955 fair-attending plans. With this information in hand, Commerce department officials hope to work out some arrangement to co-ordinate scattered U. S. exhibits into an American "theme." Bureau of Foreign Commerce also is expanding its services to businessmen: More information ahead of show time on all sorts of pertinent subjects.

Target: Selling—The U. S. government doesn't intend to pay for the transportation of any U. S. goods to a foreign trade fair; it won't buy U. S. goods to display at fairs either. Where the new program comes in is to take scattered and unorganized American attendance at a particular fair and fuse it into a recognizable whole for the foreigners to see.

Basically, the businessman still has his responsibility to sell his products; the government is now taking part of the responsibility for selling the U. S.

Further GM Expansion Abroad?

Following earlier statements that output will be expanded in Britain (Sept. 27, p. 33), General Motors President Harlow H. Curtice said GM production facilities serving Belgium, Luxembourg and the Netherlands may be expanded, too.

Mr. Curtice said that by 1960 the Benelux countries might provide an annual market for 166,000 vehicles, 26,000 more than the anticipated 1954 sales. The 1954 total, in turn, is more than three times the prewar figure.

New Trade Lists Available

The Commercial Intelligence Division, Bureau of Foreign Commerce, has published several new trade lists including "Electrical Supply & Equipment Importers and Dealers, Syria;" "Machinery Importers & Distributors, Panama;" "Metalworking Plants & Shops, the Netherlands;" and "Office Supply & Equipment Importers and Dealers, Austria."

Most of these lists are now prefaced by a brief review of basic trade and industry data collected in the course of compiling each list. For example, the trade list on the Netherlands carries this information: "In 1952, about 2300 enterprises in the metal industry, each employing a minimum of ten workers, had a total staff of 286,000."

These lists are available for $1 from the above division or any Commerce department field office.

Here's How To Put More Sense In Your Sales Training Dollar

INTENSIVE PREPLANNING can be the shortcut to the success of a sales training program.

It's credited by Rockwell Mfg. Co.'s L. A. Dixon Jr. with allowing that firm to set up a smooth-working course for its highly diversified Meter & Valve Division.

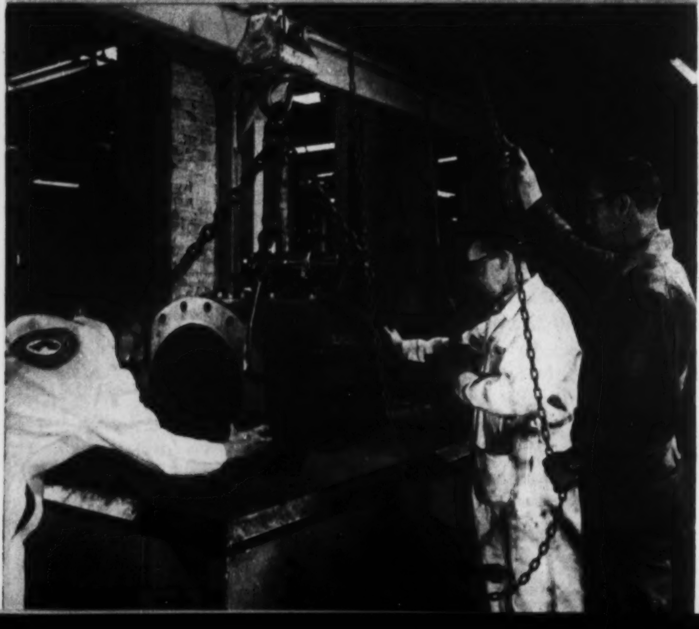
Setting It Up—Rockwell had no established sales training school, so first it found a department to set one up. Market Research was chosen because: 1. It could most easily survey current methods of sales training and training course administration. 2. It was not concerned with day-to-day operating problems and could provide a man to work full-time with the course.

Preplanning took four months. Basically, the course included three days of orientation at the Pittsburgh home office, four weeks of "psychological salesmanship" (a program developed jointly by Rockwell and an outside consultant) and seven weeks of product training in service department methods, repair parts, advertising aids and salesmen's paperwork procedure.

Budgeting Time — About 100 Rockwell employees from board chairman to shop workers made up the teaching staff. Each instructor's talk was written out or outlined in detail in advance to eliminate overlapping and to make sure each instructor contributed the most valuable information in the time allotted.

These lectures—together with charts and drawings—were bound into five manuals of about 200 pages each. Copies were furnished to each trainee.

Special emphasis is placed on shop work. Trainees take apart and put back together both Rockwell and competing products. Troubleshooting and field repair are stressed



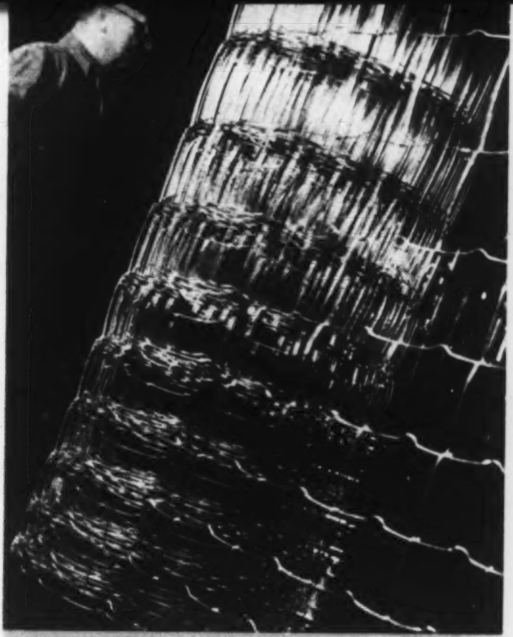
Integrating Instruction — Since each plant where training was scheduled makes a different product, tailored "product courses" were set up. Key representatives from each plant went to Pittsburgh and took a one-week course in conference leadership, public speaking and use of slides and charts. Upon returning to their plants, they arranged with other instructors for systematic presentation of all information available there. Each course, though, followed a similar pattern: Lecture, demonstration, assembly and disassembly of products by the trainees, sales review quizzes and home study.

Hotel reservations, plant-to-plant itineraries and other practical details were worked out so there would be no interruption of an 8-hour-day work schedule.

Complete records were kept on each man—including his results on some 50 written quizzes. Special evaluation forms were filled out on each student by at least two qualified sales management officials during each phase of training.

Grading Factors — Information recorded included attendance records, classroom assimilation, mechanical aptitude and assimilation of shop work, interest, ability to express thoughts, personality, appearance and general conduct.

In the first class were sales engineers and trainees with the company less than one year. Each applicant was warned in advance that failure to pass in the course might cost him his job or his future with the company. Of the 17 who started the first class, 14 qualified for sales work, one returned to his clerical job, one was made an office manager and one left the company.



Fence gets reeled up at a rate of 45-50 feet per minute at American Steel & Wire Division of U. S. Steel

Fencers On Guard for Better Sales in 1955

PRODUCTION (NET TONS)

YEAR	BARBED & TWISTED	WOVEN WIRE
1949	215,047	358,162
1950	237,604	483,920
1951	237,805	416,704
1952	240,733	331,405
1953	163,801	245,264
1954 (6 mo.)	87,832	190,327

Source: American Iron & Steel Institute.

FENCING SALES have fallen from their 1950 peak, but business is still good—and the outlook is even better.

One large producer says: "Dollar volume is running slightly higher in 1954 than in 1953 but under 1952. We expect business in the last half of 1954 will run about even with the first half and that 1955 volume will be substantially greater." That optimism for 1955 was echoed by every company STEEL talked with.

Big Seller—Woven wire fence is the big-volume item in fencing both tonnage and dollar-wise (see table above). That term includes farm and ornamental lawn fence, as well as the chain link fence commonly used for plant protection. Barbed and twisted wire makes up the other large fencing category. Some welded wire fence is on the market, but its sales are small.

Agriculture is by far the biggest user of fencing, says Republic Steel Corp. Tops for chain link are industrial users, commercial enterprises, private homes and government, according to Page Steel & Wire Division of American Chain & Cable Co. Inc.

Rising Sales—Chain link fence is the best mover right now. Sales are rising generally, with most makers reporting sales above last year and as much as 25 per cent over 1952. High rate of plant construction is mainly responsible. Home building is helping, and the government is still buying considerable tonnages.

Dragging down totals are sales of farm fence. Demand here was greatest in 1950-51 but has fallen off 15 per cent from last year and as much as 30 per cent from 1952. One reason for brightening outlook here is turnpike construction. Some superhighways will use hundreds of miles of it. Chain link sales will also benefit.

Buyers' Market—Competition in the industry is rugged. There are close to a hundred firms that manufacture fence, and many more put it up. For example, in the Los Angeles area alone, you can choose from among 85 fence erecting firms.

Most fence is sold through franchised distributors: Hardware jobbers, lumber yards and others. But some companies—among them U.S. Steel's Cyclone Fence Department and Colorado Fuel & Iron Corp.—handle chain link fence from manufacture to installation.

New Invaders—Most fencing is galvanized for protection. Aluminum and stainless steel fences are gaining increasing popularity, particularly for use in corrosive atmospheres. Nichols Wire & Aluminum Co., which makes aluminum chain link as well as galvanized farm fence, says its sales are ahead of 1952 and about even with 1953. Like other companies, Nichols looks for a good year ahead.

Imports have not given domestic firms much competition, but they may. Imported barbed wire accounts for about 15 per cent of current sales of that item, and imports are going up. In 1953 imports were 16,090 net tons; in the first six months of 1954, they were 24,126 net tons.

Quick Boosts—Imports of woven wire fence, while not large, also showed a remarkable rise. In 1953, imports were 3443 net tons; in the first six months of 1954, they were 4898 net tons.

How long does fence last? It depends considerably on atmospheric and climatic conditions. Continental Steel Corp. says some of its chain link fabric is still in good condition after 25 years of service. Other companies probably can cite comparable examples.

Specify BULLARD MACHINE TOOLS for greater manufacturing economy and efficiency.......

MULT-AU-MATIC

[illegible]

CONTIN-U-MATIC

[illegible]

CUT MASTER V. T. L.

[illegible] The 30" and 36" sizes have two heads while the 42"–54"–64" and 74" have three heads [illegible]

SPACING TABLE

[illegible]

MAN-AU-TROL V. T. L.

[illegible]

HORIZONTAL BORING, MILLING AND DRILLING MACHINE

[illegible]

VERTICAL CHUCKING GRINDER

[illegible]

THE BULLARD COMPANY
BRIDGEPORT 2, CONNECTICUT

By **FLOYD G. LAWRENCE** *Detroit Editor*

MIRRORS OF MOTORDOM

The light socket gets its start as girls assemble stampings, springs and pins on moving assembly fixtures

Here the sockets complete their dipping cycle and emerge from coolant bath. Inspection and packing follows

Automation: One Road to Parts Suppliers' Survival

ANY WAY you look at it, an auto supplier is a guy who gets the business from the auto companies.

Many an auto supplier is looking at it in the more colorful sense these days. As usual, the small stampers and the screw machine products boys have their teammates by the tonsils, but there's feeling that this shakeout is shaping up into something rougher than the traditionally rough competition for auto business.

Facts of Life—It's no secret that as sales come harder the auto companies are taking a long look at costs. During the last year or so, all the auto companies have made quite a point of the facts of life. There's nothing new in that, but the approach this time has been positive. Suppliers are being advised to take a look at their methods, build for the future.

There's a mighty good reason for that approach. Auto companies recognize that even a small order is mighty big business for a supplier. They remember times past when plenty of companies took jobs just to get the scrap money or operated at a loss, and the situation today is primed for a repeat performance. Many suppliers took auto work to fill equipment idled by canceled military contracts, while others got a foot in the door on the strength of being able to get material when others couldn't.

These are the boys who were made competitive by circumstances rather than by ability.

Price Isn't All—The slim showing of Chrysler Corp. and the independents this year sent plenty of peddlers to new lobbies, and the only thing many had to offer was price. On the surface that's swell, but in all but the exceptional case, the price was based on a minimizing of loss rather than sound savings. That creates suppliers with built-in bankruptcy, and as one company puts it, "something you don't get isn't cheap."

That's the reason for the build-for-the-future approach. Auto companies figure pressure applied in the right way, in getting suppliers to take a new look at their methods, just as the auto companies themselves are doing, will yield genuine savings that can be passed along to the consumer, opening the door for more car sales. Automation today, figure the auto companies, "must extend beyond our lines to the lines of our suppliers."

Politics and PAs—This is political talk of the sort often calculated to keep newsmen writing worthwhile things about auto companies. And reports come in regularly of old-line suppliers cut out by upstarts purely on the basis of price. Then, too, it must be borne in mind that purchasing agents live by showing gains much like labor leaders, and their statements might be just as objective.

To pinpoint what's wanted in black and white, an example of a model auto supplier was requested from an auto firm. Watts Electric & Mfg. Co., Birmingham, Mich., was suggested. This suburban Detroit outfit does not deal in units of electricity as the name suggests, but does do a desirable business in auto light sockets, basically a stamping assembly.

Automation's Role—Genial President Ed Heller proved to be as

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helpful as a dictionary at a Scrabble match. "There's no doubt about it," says Mr. Heller, while engineering son, Bob, nods approval. "Automation is not only as important to the supplier as it is to the auto company he supplies, it's more important. If the supplier can't offer his customer something he needs at a price within his budget, how can he justify his existence?"

To prove his point, Ed Heller led the way back into his modern but unpretentious plant. There, in a working area perhaps 100 x 200 feet, only 18 production people are now turning out 30 per cent more lamp sockets than formerly were fabricated by 60 people with previous equipment.

Turn-About — Although Watts Electric have 32 punch presses and produces most of its components, certain components produced on specialized equipment are purchased elsewhere for less money. "We capitalize on the know-how of our supplier just as our customers capitalize on the things we do best," comments Ed Heller.

Ed Heller's point: Do one job better than your competitor. The job Watts Electric does is furnishing auto lamp sockets sealed against dirt and moisture at a price as low as or lower than unsealed sockets. The group of three dipping machines developed by the firm tells its own story.

Technique — As shown in the photo of the sockets, a plastisol is fused to the rear of the socket to seal out dust and moisture. The machines doing this job have a preheating oven, dipping bath, fusion oven and liquid cooling bath through which pass 550 arbors attached to a continuous roller chain.

A metal socket is placed on each arbor and the assembly is preheated causing a gel-layer to form on the surface after dipping. That layer, in turn, picks up additional liquid plastisol. Precise coating thickness is maintained on the 70-foot machines, and, together, they can turn out 280,000 units in a 24-hour period. Already new and improved versions of the machine are being planned.

Simplicity — Because the other production equipment at Watts Electric is not hamstrung with electronic wizardry doesn't mean it isn't efficient. A look at the girls assembling light sockets on moving fixtures traveling through a couple of converted punch presses tells part of the "simple but effective" story. Son, Bob Heller, adds more.

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,000
February	573,801	628,017
March	672,485	752,149
April	676,233	782,491
May	621,249	684,843
June	623,732	713,778
July	543,540	756,592
August	523,790	640,186
September	365,000*	605,228
October		651,153
November		457,852
December		529,588
Total		7,815,877
Week Ended	1954	1953
Aug. 28	113,496	152,866
Sept. 4	110,995	132,574
Sept. 11	84,556	122,863
Sept. 18	74,026	146,912
Sept. 25	71,017	140,953
Oct. 2	78,000*	142,824

Source: Ward's Automotive Reports.
*Estimated by STEEL.

"We don't have any engineering geniuses round here. We define our problem and start working on possible solutions until we find one that works. When we've got something that will work we just keep trying to find a way to do it better. You might say our motto around here is 'The only way to solve a problem is to work on it.' "

That's the kind of an outfit Watts Electric & Mfg. Co. is, but what kind of an outfit is yours?

The Key—The automakers don't see competition sounding the death-knell of the auto supplier who is on his toes. They don't see justification for a rash of mergers among auto suppliers on the assumption that a successful supplier must be big, nor do they plan an assimilation of supplier functions into their own plants. But they do see efficiency as the key to survival in the years ahead.

"What is the best way to make the part?" That's the question one purchasing agent says must be substituted for the familiar: "What do we have available to put the job on?" In many cases that will mean special equipment built to do the job with automatic handling to get the full capacity out of the machine. It means the creative approach to a quotation rather than the sharp pencil.

But beyond that, it means a challenge and progress for the businessman who enjoys a scrap as an automotive supplier.

Auto Sales Hold On

New car sales for the first ten days of September were even with average daily sales in August—a very healthy sign since the first ten days are generally below the rest of the month. So it looks like September, 1954, sales will mark the second time since 1947 that September sales have increased over August.

Other ways of looking at the highly promising sales figure: Domestic new car sales ran a full 17 per cent over estimated production of 115,000 cars for the ten-day period, says *Ward's Automotive Reports.*

Ford Motor Co.'s Lincoln-Mercury Division reports Lincoln new car sales for the first 10 days of September were the best since June, 1953; Studebaker reports retail sales of its cars and trucks during the same period were the highest of any 10-day period since Oct. 31, 1953.

The way it shapes up now, September selling may top production by at least 50 per cent.

$70-Million Loan for Automaker

Studebaker - Packard Corp. arranged to borrow $70 million—$25 million in a loan and a $45-million line of credit—to start its merged corporate life on Oct. 1.

Prime purpose of these money matters is the Studebaker-Packard plan to take 4 per cent of the 1955 auto market of an estimated 5.4 million cars. At last count, they shared a total of 2.4 per cent.

Another purpose of the borrowing is to reduce manufacturing costs and justify price cuts, says James Nance, Studebaker-Packard president. Mr. Nance says substantial economies of the merger won't be felt until the 1956 model year.

Yes

Leaded Steels Can Be Forged

This is our answer based on experience with many producers of forgings who have used leaded steels. Ledloy* and leaded alloy steels can be heated and forged in exactly the same manner as comparable standard steels.

No modifications in forging practices have been necessary is the report from users of leaded steels.

Leaded alloy steels and leaded carbon steels for forging are available in all standard or S. A. E. compositions and in any of our standard sections. Write today for complete information about application of leaded steels to your forged product.

*Inland Ledloy License

Are leaded steel forgings readily machinable?

Yes, the use of leaded steel forgings will result in the same improved machinability as is obtained in leaded steel bars.

Loss of lead due to heating?

Investigation has shown that the exudation of lead upon heating leaded steels is confined primarily to the scale. The lead content in the forging proper remains virtually intact.

Does lead affect mechanical properties?

No, the addition of lead does not materially affect the mechanical properties of forging.

Is there a health hazard?

Not generally. With ventilation normally required in forge shops, the use of leaded steels does not present a hazard.

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Cleveland, Ohio

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Chicago, Illinois

1807 Elmwood Avenue
Buffalo, New York

7251 General Motors Bldg.
Detroit, Michigan

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For export—Copperweld Steel International Company, 117 Liberty Street, New York

How to get the one tube steel that's best for your job: *Ask the experts!*

This month's report is on: **SICROMO 2**

Has outstanding surface and structural stability at 1200° F. Has better oxidation and corrosion resistance than 2% Cr.-Mo steel. Recommended for service up to 1200° F. as tubes in cracking coils, reforming units, heat exchangers, vapor line and hot oil piping. Also as return-bend forgings for oil heaters.

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Carbon
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Sicromo 2
Sicromo 2½
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16-13-3
25-20*
25-12*
35-15**
16-25-6**

** Available as seamless tubing on an experimental basis only.*
***Not available as seamless tubing.*

YOU can probably find several high temperature tube steels that will solve your heat, pressure, corrosion and oxidation problems. But only one steel will give you maximum tube life per dollar.

To get the one high temperature tube steel that's best for your job, ask the metallurgists of the Timken Company. They *are* the experts!

With more than 20 years of steel research and experience, Timken Company metallurgists are recognized authorities on high temperature steels. They'll put this experience at your disposal. Help you select from 24 different analyses the one tube steel that will give you the best life/cost ratio. And regardless of which analysis you select, you'll be assured of uniform quality. The Timken Company rigidly controls quality from melt shop through final inspection.

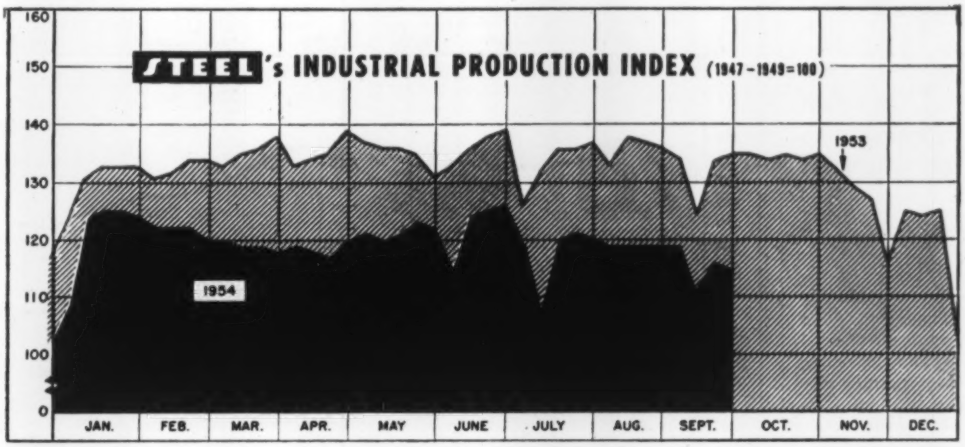
Let the Timken Company help you with your tube problems. *Ask the experts!* The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

Chlorination apparatus purifies extracted non-metallic residues to determine steel cleanliness. Research like this helps assure the Timken Company's leadership in high temperature steels.

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

TIMKEN
STEEL

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



LATEST WEEK*	115
PREVIOUS WEEK	116
MONTH AGO	119
YEAR AGO	135

* Week ended Sept. 25.

Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 11%.

Booming Construction Builds Sales for Metalworking

CONSTRUCTION bids to keep its position as the economy's pacesetter well into 1955. How long the record setting will continue is anybody's guess, but odds are that activity will stay at near-peak levels at least through the first half of the new year.

Contracts for future construction are holding up well—another record is due to fall in September, *Engineering News-Record* predicts—and if awards remain at all close to the present volume any drop in 1955 will be a small one.

More Gains — All branches of construction have a hand in the boom. And most categories will hold at present high levels. Marked increases are forecast for highways, schools, community facilities and commercial building.

Pipelines, too, are in for a big upswing. Plans are in the works for several vast pipeline networks, plus numerous smaller projects.

Higher Sales — All of which means more sales for metalworking. Delivery times of certain kinds of pipe are already lengthening, with orders booked into December in some cases. Other branches of construction will boost demand for structural steel, weldments, reinforcing rod, not to mention fence and wire and cable. Also from metalworking comes the tools and machines the builders use.

And construction means good news for appliance makers. Nonfarm housing starts in August were 111,000. That's strong for this time of year, according to the Labor department, and represents a seasonally adjusted annual rate of 1,130,000 units. If building continues at the same rate for the rest of the year, 1954 will be the second-best housing year in history. Record was set in 1950.

New Records—Some $52 billion worth of construction will be put in place before 1954 is over, probably an all-time record, says H. E. Foreman, managing director of the Associated General Contrac-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,642	1,637	2,149
Electric Power Distributed (million kwhr)	9,056[1]	9,074	8,354
Bitum. Coal Output (daily av.—1000 tons)	1,320	1,108	1,611
Petroleum Production (daily av.—1000 bbl)	6,145[1]	6,196	6,486
Construction Volume (ENR—millions)	$341.9	$306.4	$180.8
Automobile, Truck Output (Ward's—units)	71,017	74,026	140,953
TRADE			
Freight Car Loadings (unit—1000 cars)	675[1]	711	820
Business Failures (Dun & Bradstreet, no.)	186[1]	195	152
Currency in Circulation (millions)[3]	$29,888	$29,998	$30,210
Dept. Store Sales (changes from year ago)[3]	0%	−5%	+6%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$20,280	$17,954	$19,784
Federal Gross Debt (billions)	$274.7	$274.9	$272.4
Bond Volume, NYSE (millions)	$15.4	$14.5	$12.5
Stocks Sales, NYSE (thousands of shares)	10,773	10,401	5,538
Loans and Investments (billions)[4]	$83.1	$82.7	$79.5
U. S. Gov't. Obligations Held (billions)[4]	$35.8	$35.5	$31.6
PRICES			
STEEL's Finished Steel Price Index[5]	194.19	194.19	189.38
STEEL's Nonferrous Metal Price Index[6]	218.3	218.2	204.3
All Commodities[7]	109.9	110.0	110.7
Commodities Other Than Farm & Foods[7]	114.4	114.5	114.6

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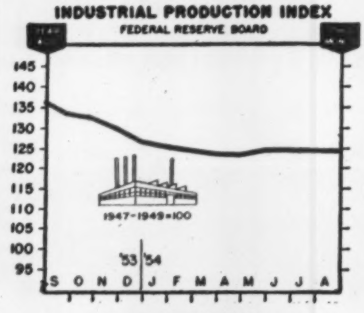
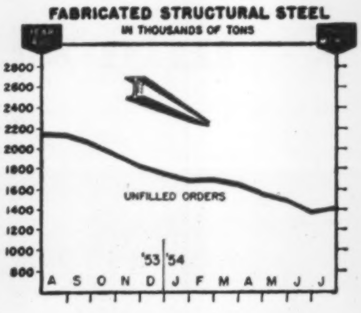
*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1954, 2,384,549. 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.



(seasonally adjusted)

	Total Production		Primary Metals		Metal Fabricating	
	1954	1953	1954	1953	1954	1953
Jan.	123	134	111	135	155	168
Feb.	124	134	108	137	152	168
Mar.	123	135	103	136	148	168
Apr.	123	136	104	136	146	169
May	124	137	106	139	147	169
June	124	136	108	137	145	168
July	124	137	104	136	148	171
Aug.*	124	136	106	137	148	171
Sept.	...	133	...	130	...	166
Oct.	...	132	...	128	...	165
Nov.	...	129	...	122	...	159
Dec.	...	126	...	113	...	156
Avg.	...	134	...	132	...	167

Federal Reserve Board. *Preliminary.
Charts Copyright 1954 STEEL.



	Shipments		Backlogs	
	1954	1953	1954	1953
Jan. ...	245.6	241.4	1.686	2.180
Feb. ...	253.1	251.1	1.697	2.128
Mar. ...	285.4	266.3	1.645	2.155
Apr. ...	293.5	263.2	1.566	2.168
May ...	254.1	263.8	1,490	2,179
June ...	290.3	274.6	1,391	2.153
July ...	243.8	230.3	1,429	2.134
Aug. ...	....	251.1	....	2 122
Sept. ..	....	255.6	....	2.041
Oct. ...	....	295.5	....	1,927
Nov. ...	....	257.8	....	1,804
Dec. ...	....	266.9	....	1,741
Total ..	....	3,117.6		

American Institute of Steel Construction.

tors of America. That volume will include more than $36 billion for new construction and more than $15 billion for repair and maintenance. Over $1 out of every $7 being spent for end products and services is for construction, he says.

This will be the ninth consecutive year that construction has set new records. The 1954 total is expected to top 1953's record $50 billion by 3 or 4 per cent.

Employment Rises Quietly . . .

Construction is one of the reasons for the improvement in the labor situation noted across the nation. The pickup isn't large in any one locality, but in the aggregate it adds up.

Areas not sharing in that prosperity are those producing primarily autos, nonelectrical machinery, steel and coal, according to the Labor department. Chances are that the next two months will bring some relief to those areas, too.

The employment increase was so widespread that the Bureau of Employment Security's new area classification list included only six changes in major area status. Four of the shifts were in response to an improved labor situation; two were because of worsened conditions. Columbus, O., Aurora, Ill., Jackson, Miss., and Kenosha, Wis., were better, but all still have labor surpluses. Muskegon, Mich., and Charlestown, W. Va., moved into a greater labor surplus category.

In Columbus, hiring was occasioned by pickups in construction, trade, government, machinery and food processing.

The picture for over-all employment is steady through November. By then automobile centers will show improvement. Gains are also seen for steel, aircraft, farm machinery, major appliances and textiles.

There won't be any net gain in employment, though, because summer workers are leaving the labor market.

Why Business Is Better . . .

Chamber of Commerce of the U. S. names four reasons (in addition to construction) why business is getting better: 1. Income after taxes is at an all-time high. 2. Foreign trade is improving. 3. Unemployment insurance claims are declining. 4. The inventory situation has improved considerably.

For stress, wear or vibration a
GRIPCO LOCK NUT
will hold tighter, wear longer, cost less!

The Gripco Lock Nut, with its simple, one-piece design, has given industry a tighter, more positive holding action for quicker fastener application at less initial cost. It provides frictional resistance to vibration and loosening torque — is faster to use — permits repeated removal and reapplication—simplifies production—lowers manufacturing and maintenance costs — has improved the durability of hundreds of products—and has insured greater customer satisfaction. If stress, wear or vibration is your problem, specify Gripco Lock Nuts for greater holding power. Impervious to oil or water. Write for samples and full details.

GRIPCO PRODUCTS INCLUDE:
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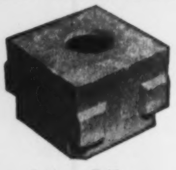

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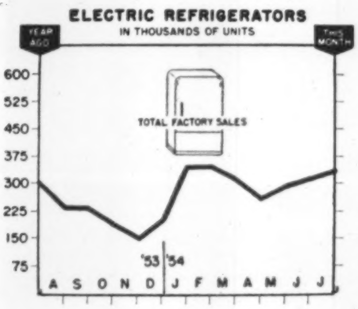
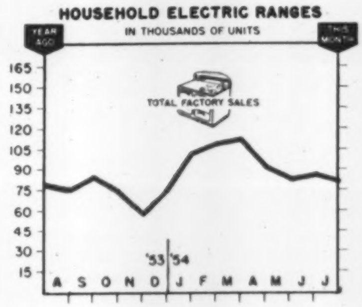


Total Factory Sales—Units

		1954	1953	1952
Jan.	....	344.101	325.186	260.259
Feb.	....	334.122	377.605	259.838
Mar.	....	303.535	368.498	276.972
Apr.	....	249.388	366.951	225 994
May	....	282.164	317.667	217,017
June	....	303.127	343.114	324.885
July	.....	325.061	298.838	333.877
Aug.	....	......	232.981	250.224
Sept.	....	......	231 224	230.111
Oct.	....	......	179.749	207.065
Nov.	....	......	139.563	256.530
Dec.	....	......	197.102	248,506
Total	....	......	3,378,478	3,091,434

National Electrical Mfrs. Assn.



Total Factory Sales—Units

		1954	1953	1952
Jan.	....	101.870	88.145	79.982
Feb.	....	109.617	114.465	63.063
Mar.	....	112.232	130.788	93.225
Apr.	....	90.940	118.999	69.149
May	....	82.649	114.404	68.117
June	....	85.8[illegible]4	113.086	86.817
July	....	80,017	77.836	83.465
Aug.	....	......	74.326	74.853
Sept.	....	......	84.481	62.404
Oct.	....	......	73.422	63.143
Nov.	....	......	55.748	72.982
Dec.	....	......	73.870	84.630
Total	...	......	1,119,570	901,860

National Electrical Mfrs. Assn.

The nation is selling and consuming more than it's producing, so production is bound to turn up. The Chamber points out one more reason for the continuing boom in construction: Movement of population from the cities to the suburbs, with a resulting need for new utilities, transportation facilities, schools, churches and shopping centers. This, in turn, attracts more people—and so it goes.

PA's Look Ahead . . .

Reinforcement of the beginning climb of the economy is provided by the September survey of the National Association of Purchasing Agents. Reports of increases in new orders and production outbalance decreases 3 to 1. The improvement in orders is even better than that of production, heralding higher production to come.

Prices, in general, are showing more strength and stability, and inventories are lower with a strong trend to stabilize. Employment is up, and prospects are good for further hiring in October.

Buying policy remains conservative—60 days and under—but longer-range planning is under way. For a while, though, hand-to-mouth will still be the rule. The PAs expect no quick surge in business, but a steady increase in a tightly competitive market.

New Firms Shade Failures . . .

Business failures in August were highest for that month since before World War II with 912 firms going under, but 9,041 new business incorporations—highest for the month since 1946—took some of the sting out of that.

For the first eight months of 1954, charters were issued to 76,340 applicants. This is 8 per cent over 1953, reports Dun & Bradstreet (see p. 57 for more details).

Trends Fore and Aft . . .

Business in the Pittsburgh district hit a three-month high in mid-September, says Business Research Bureau of the University of Pittsburgh. . . . Freight car loadings may yet find the upward track. Recently, loadings went over 700,000 in a week for the first time since the end of June. . . . Wages and salaries will catch up with last year's level in December, says A. W. Zolomek of International Statistical Bureau Inc. Happily, he sees no accompanying rise in the cost of living.

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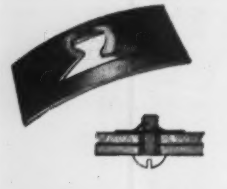
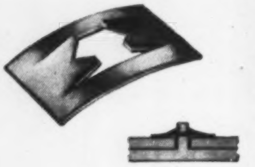


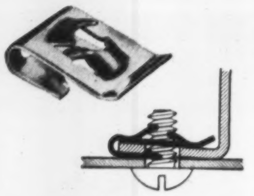
FLAT TYPE

One-piece self-locking spring steel fasteners. Replace threaded nuts, lock washers or spanner washers. Available in a wide variety of shapes and screw sizes.



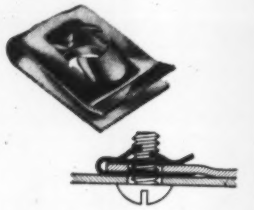
PUSH-ON

Zip over unthreaded die cast or plastic studs, rivets, nails, tubing, or wire to lock parts securely. Removable types available in many sizes.



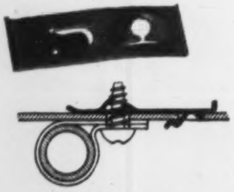
"J" TYPE

Snap over edge of panels and into center hole locations. Hold themselves in place for blind assembly. Full range of panel thicknesses and screw sizes available.



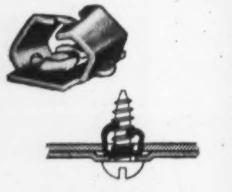
"U" TYPE

Perform same function as "J" type for reduced materials handling. Used where full bearing on lower leg of the SPEED NUT is required.



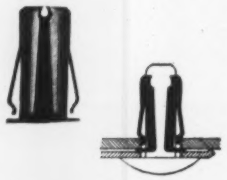
LATCH TYPE

Easily applied by hand, are self-retained in bolt-receiving position at center panel locations for blind attachments. Front mounting types are also available.



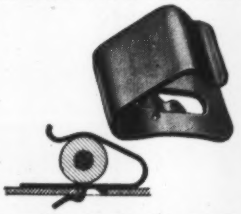
EXPANSION TYPE

For lightning-fast attachments in blind locations. Snap into mounting holes by hand. Screw spreads spring fingers, wedge-locks part in position. Secure, vibration-proof attachment.



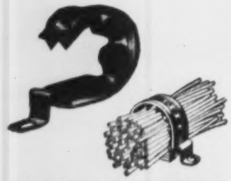
TUBULAR CLIPS

For use with unthreaded studs or rivets. Virtually "nails" panels together where there is access to one side only. Permanent lock or removable types.



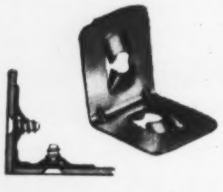
CABLE, WIRE, AND TUBE RETAINERS

Snap in place by hand, self-retained in position to receive wide range of cable, wire and tube sizes. Easily removed for service or re-location.



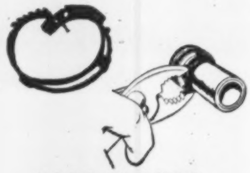
HARNESS CLAMPS

Open or close by hand — no tools needed. Attach to panel or pre-assemble to harness before installation. Cushioned to protect wires. Cannot open accidentally.



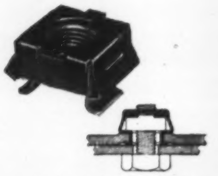
ANGLE BRACKETS

Combine bracket and fastener to reduce number of parts, speed up assembly and strengthen the structure. Variety of shapes and sizes.



HOSE CLAMPS

Self-locking, ratchet-type design, one-piece low profile construction — no bolts, nuts or thumb screws. Fast and easy to apply and remove for medium- and low-pressure connections.



NUT RETAINERS

Retain square nuts in blind locations. No welding, clinching, staking — snap in by hand. Provided in a wide range of screw sizes. "U" and "J" type retainers available.

Engineer Savings into your products with SPEED NUTS® — *The Fastest Thing in Fastenings!*®

Assembly cost savings from 30% to 75% . . . increased product quality . . . reduced materials handling . . . far less field service problems. These are a few of the reasons why more and more manufacturers are specifying SPEED NUT brand fasteners. Write today for your copy of "Savings Stories"—a book full of cost-saving fastening reports. TINNERMAN PRODUCTS, INC., Box 6688, Cleveland 1, Ohio. *In Canada:* Dominion Fasteners Ltd., Hamilton, Ontario. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales. *In France:* Aerocessoires Simmonds, S. A., 7 rue Henri Barbusse, Levallois (Seine).

TINNERMAN *Speed Nuts*®

MORE THAN 8000 SHAPES AND SIZES

ARTHUR J. MILLER JR.
. . . heads Chicago Wheel & Mfg.

E. C. ROOK
. . . Blaw-Knox div. v. p.-gen. mgr.

ROBERT H. DAVIES
. . . Parker Appliance v. p.-engineering

Chicago Wheel & Mfg. Co., Chicago, elected **Arthur J. Miller Jr.** president and general manager. Formerly treasurer and factory manager of the Valparaiso, Ind., plant, he succeeds **A. J. Miller Sr.**, named chairman of the board. Other elections include: **Henry E. Miller,** vice president and general production manager; **Henry M. Mann,** treasurer and chief of sales engineering; and **Arthur T. Dalton,** secretary and general sales manager. **I. Danielson,** long associated with the firm, was elected vice president emeritus and continues in his capacity of adviser on financial matters.

Charles E. Peterson is now chief metallurgist of **Mackintosh-Hemphill Co.,** Pittsburgh. He joined the company in 1949 as a metallurgical assistant to the vice president-research and development. In 1953 he left the firm and, until recently, was a sales and research metallurgist for the rolls division of Blaw-Knox Co.

Howard W. Lewand was made manager of tubular sales for **Hill-Chase & Co.,** Philadelphia. He was formerly sales manager of Illinois Tube Co.

Herman J. Schorle, works manager of Bendix Aviation Corp., joined **Tobe Deutschmann Corp.,** Norwood, Mass., in a similar position.

E. C. Rook was appointed vice president and general manager of **Blaw-Knox Co.'s** equipment division, which has its main plant at Blawnox, Pa., and a branch plant at Elyria, O. He succeeds **G. L. Dirks,** resigned. Mr. Rook recently retired as a U. S. Navy captain.

Allen Whitehead was appointed manager, nickel and nickel alloy division, **Metal Goods Corp.,** St. Louis. For the last eight years he has been a general line sales representative in the firm's New Orleans territory.

Daniel J. McLane Jr. was appointed manager-sales of **General Electric Co.'s** large steam turbine-generator department, Schenectady, N. Y. He was made manager of production control for the turbine division in 1951.

M. F. Valade was appointed manager, chemical and metallurgical engineering, **Ford Aircraft Engine Division,** Ford Motor Co., at Chicago. He succeeds **A. B. Richards,** transferred to another position within the company.

Alfred H. Williams, formerly vice president-sales and a director, Consider H. Willett Inc., was named general sales manager of **Reynolds Metals Co.'s** window division, Louisville. **Keith Hall** was named transportation sales manager for the company.

Robert H. Davies was made vice president of engineering for **Parker Appliance Co.,** Cleveland, and its subsidiaries. He has served since 1946 as engineering manager.

Harold C. Sager was elected president of **K & K Metal Works Inc.,** Buffalo. He succeeds **Peter T. Acara,** retiring as president but retaining his position as secretary. **Nicholas Panzarella** was elected vice president-manufacturing.

Benjamin Electric Mfg. Co., Des Plaines, Ill., appointed **G. F. Niemann** works manager; **A. H. Meyer,** manager of manufacturing engineering; **C. E. Rackley,** chief engineer; **C. P. Mors,** general superintendent; **H. A. Flentge,** production manager; **E. H. Church,** manager of industrial engineering; **R. I. Klipstein,** plant engineer; and **J. R. Chambers,** sales promotion and advertising manager.

Lawrence R. Tierney was made vice president, **Pennsylvania Foundry Supply & Sand Co.,** Philadelphia. **John M. Robb Jr.,** formerly with Hickman Williams & Co., also was made a vice president.

Diamond Alkali Co., Cleveland, appointed **Kemble S. Lewis** sales manager, plastics division. He is succeeded as assistant branch manager in Chicago by **Olin Smith. Dr. Albert W. Meyer** was appointed

DR. HOWARD S. TURNER
. . . J&L v. p.-research and dev.

CHARLES H. SCHWERIN
. . . Gas Machinery furnace div. mgr.

to the newly created position of director of exploratory research.

Dr. Howard S. Turner, effective Oct. 15, becomes vice president-research and development of **Jones & Laughlin Steel Corp.**, Pittsburgh, to succeed Vice President **H. W. Graham**, who becomes consultant on technology. Dr. Turner was formerly director, research and development division, Pittsburgh-Consolidation Coal Co. **Dr. Harold T. Clark** was promoted to director of research at J&L. **Robert E. Minto** becomes chief metallurgist of the Cleveland Works division to succeed **Don M. Johnson**, who was appointed to a position on J&L's metallurgical contact staff. **J. W. Culver** is assistant chief metallurgist.

C. E. Cummings was made manager of **American Can Co.'s** Lemoyne, Pa., plant to succeed **G. A. Vaughan**, who has been temporarily assigned as assistant manager of the firm's Philadelphia factory. **R. A. Fistere** replaced Mr. Cummings as plant manager in Tampa, Fla.

Miss Florence Parcella was named purchasing agent, Congress Drives Division, **Tann Corp.**, Detroit.

A. Rasmussen has resigned as vice president and plant manager of **Fahralloy Corp.**, Harvey, Ill.

Dunstan S. Gross heads the research and development departments of **Friden Calculating Machine Co.**, San Francisco, in addition to duties as factory manager.

Gas Machinery Co., Cleveland, appointed **Charles H. Schwerin** manager of its industrial furnace division. With 19 years' experience in the industrial furnace field, his previous position was manager of sales and sales engineering for George J. Hagan Co.

Clark Equipment Co., Buchanan, Mich., in a realignment of executive responsibilities, placed **Charles H. King** and **Robert H. Davies,** vice presidents, in over-all direction of, respectively, its automotive division and its industrial truck division. Mr. King was formerly in charge of manufacturing operations, and Mr. Davies was in charge of industrial truck production and engineering. **E. M. Schultheis**, vice president previously in charge of automotive division sales, will serve as a consultant to the president. **W. E. Schirmer,** vice president previously in charge of industrial truck division sales, will be assigned to handle special projects involving management planning, market research and other corporate matters.

John W. Kelly was elected vice-president-engineering for Adel Precision Products Division, **General Metals Corp.**, at Burbank, Calif.

Parker Rust Proof Co., Detroit, named **Dr. R. C. Gibson** assistant vice president and **E. W. Richards** technical director.

A. O. Wood was made Chicago district manager, TOCCO Division, **Ohio Crankshaft Co.**

Randolph R. Gustafson was made Chicago district manager for **Southern States Iron Roofing Co.**

Louis M. Marshall was made superintendent of the mason and labor department of **Republic Steel Corp.'s** Warren, O., district steel plants. He succeeds the late **J. G. Hanes. Harry L. Anderson** was made assistant superintendent.

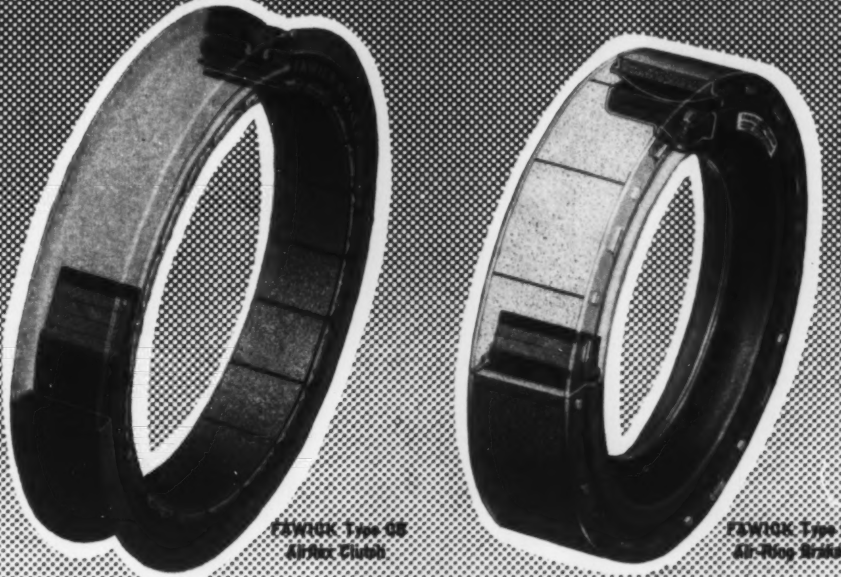
Robert L. Earle joined **Marquardt**

CHARLES H. KING

ROBERT H. DAVIES

. . . new responsibilities at Clark Equipment Co.

FAWICK AIRFLEX



EXECUTIVE REMINDER:

Investigate the advantages of Fawick Clutches for all your industrial equipment

No single component on modern machines can contribute so many advantages to overall efficiency as the clutch unit.

Fawick Airflex Clutches and Brakes provide *all* the advantages made possible by drum type operation and air actuation.

Among these are (1) more effective power transmission through application of clutch pressure at maximum diameter; (2) smooth performance through absorption of load and operating shocks; (3) unmatched low maintenance through elimination of wear adjustment or lubrication.

You are cordially invited to use the outstanding Fawick Engineering Service to investigate the advantages of Fawick Airflex Clutches and Brakes as applied to your production equipment.

FAWICK AIRFLEX DIVISION
FEDERAL FAWICK CORPORATION
9919 CLINTON ROAD • CLEVELAND 11, OHIO

For further information on Fawick Industrial Clutch and Brake Units, write to the Main Office, Cleveland, Ohio for Bulletin 400-A.

FAWICK Airflex
INDUSTRIAL CLUTCHES AND BRAKES

JACK W. WEBER
. . . MM&M div. gen. sales mgr.

CARL J. MEISTER
. . . Atkins Saw Div. v. p.-sales

G. A. ANDREE
. . . MM&M div. gen. sales mgr.

Aircraft Co., Los Angeles, as vice president-administration.

Jack W. Weber joins **Aeroil Products Co. Inc.**, South Hackensack, N. J., as sales manager. He was formerly with Minnesota Mining & Mfg. Co.

H. L. Wentworth, chief design engineer, was named vice president and chief engineer of **Continental Industrial Engineers Inc.**, Chicago. **R. E. Angley**, chief project engineer, was made manager of estimating and sales engineering, and **R. E. Liston** was made purchasing agent.

John C. Moore will represent the industrial sales division of **Henry Disston & Sons Inc.** in metropolitan Cleveland and northeastern Ohio.

Advanced to new positions in the plastics production department of **Dow Chemical Co.**, Midland, Mich., are **Max Key**, made assistant production manager, and **A. T. Maasberg**, made technical director.

Carl J. Meister was appointed vice president-sales, **Atkins Saw Division**, Borg-Warner Corp., at Indianapolis. He was formerly vice president and director of sales for Atlas Chain & Mfg. Co.

Lucas P. Hart Jr. was made manager of manufacturing for **General Electric Co.'s** capacitor department at Hudson Falls, N. Y. He succeeds the late **J. T. Holleran**.

Col. H. George Gerdes, U. S. A. (ret.), was made power engineer for **Kaiser Engineers Division**, Henry J. Kaiser Co., Oakland, Calif.

Charles C. Shackford was named product engineer, electrical wire division, **John A. Roebling's Sons Corp.**, Trenton, N. J.

Stan Andrews was named manager, appliance control division, **General Controls Co.**, Los Angeles.

Dr. John L. Porter was made assistant director, chemical research department, **Kaiser Aluminum & Chemical Corp.**, Oakland, Calif.

The "Shaw-Box" Crane & Hoist Division of **Manning, Maxwell & Moore Inc.**, Muskegon, Mich., appointed **G. A. Andree** general sales manager. He has been director of engineered crane sales.

Quebec Iron & Titanium Corp., Quebec, appointed **Roy B. Young** general manager to succeed **F. E. Walling**, resigned.

A. C. Meixner was made assistant sales manager, apparatus products, for **Westinghouse Electric Corp.**, Pittsburgh. **C. M. Brinsley** is manager, generator sales section.

E. W. Bliss Co. appointed **Arthur Sansom** to the sales engineering staff of its can machinery division at New York.

John M. Horvath was appointed a direct factory representative for **Hy-Pro Tool Co.** with headquarters in New Bedford, Mass.

Harry E. Anderson was appointed Seattle plant representative for Ryertex-Glyco Division, **Joseph T. Ryerson & Son Inc.**

OBITUARIES . . .

Seward H. French Jr., 49, vice president in charge of industrial and public relations, **Crucible Steel Co. of America**, Pittsburgh, died Sept. 20 after an attack of bulbar polio.

Ernest C. Bowers Sr., 74, founder and president, **Bowers Machine Co.**, Kalamazoo, Mich., died Sept. 18.

Edward J. Kreiger, 56, superintendent, **Rochester Smelting & Refining Co.**, Rochester, N. Y., died Sept. 13.

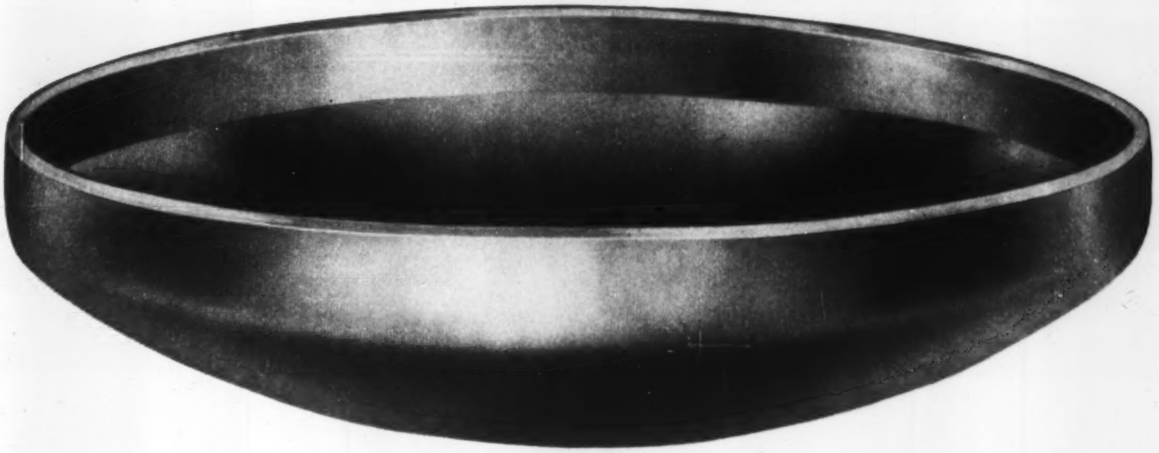
Ashton B. Cooper, 70, president, **Ferguson Electric Ltd.**, Toronto, Ont., died Sept. 15.

Norman F. Wiss, 58, executive vice president, treasurer and director, **J. Wiss & Sons**, Newark, N. J., died Sept. 15.

Basil J. Spellen, 63, superintendent, **Aro Equipment Co.**, Cleveland, died Sept. 22.

Arthur R. Schumann, 48, sales manager, **Standard Tube Co.**, Detroit, died Sept. 18.

CARBON, ALLOY, STAINLESS-CLAD AND OTHER FERROUS AND NON-FERROUS METALS



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You name it and we'll supply it. Claymont Flanged and Dished Heads are available in carbon, alloy and stainless-clad steel in diameter sizes from 9 inches to 19 feet—in thickness from 3/16 inch to 6 inches. Our flanging department can also handle forming operations on both ferrous and non-ferrous metal supplied by you.

To order, contact our nearest sales office or write direct to Claymont Steel Products Department, Wickwire Spencer Steel Division, 813 West Street, Wilmington 99, Delaware.

For your convenience, Claymont Flanged and Dished Heads are strategically stocked at CF&I warehouses throughout the country.

CF&I **Claymont Steel Products**

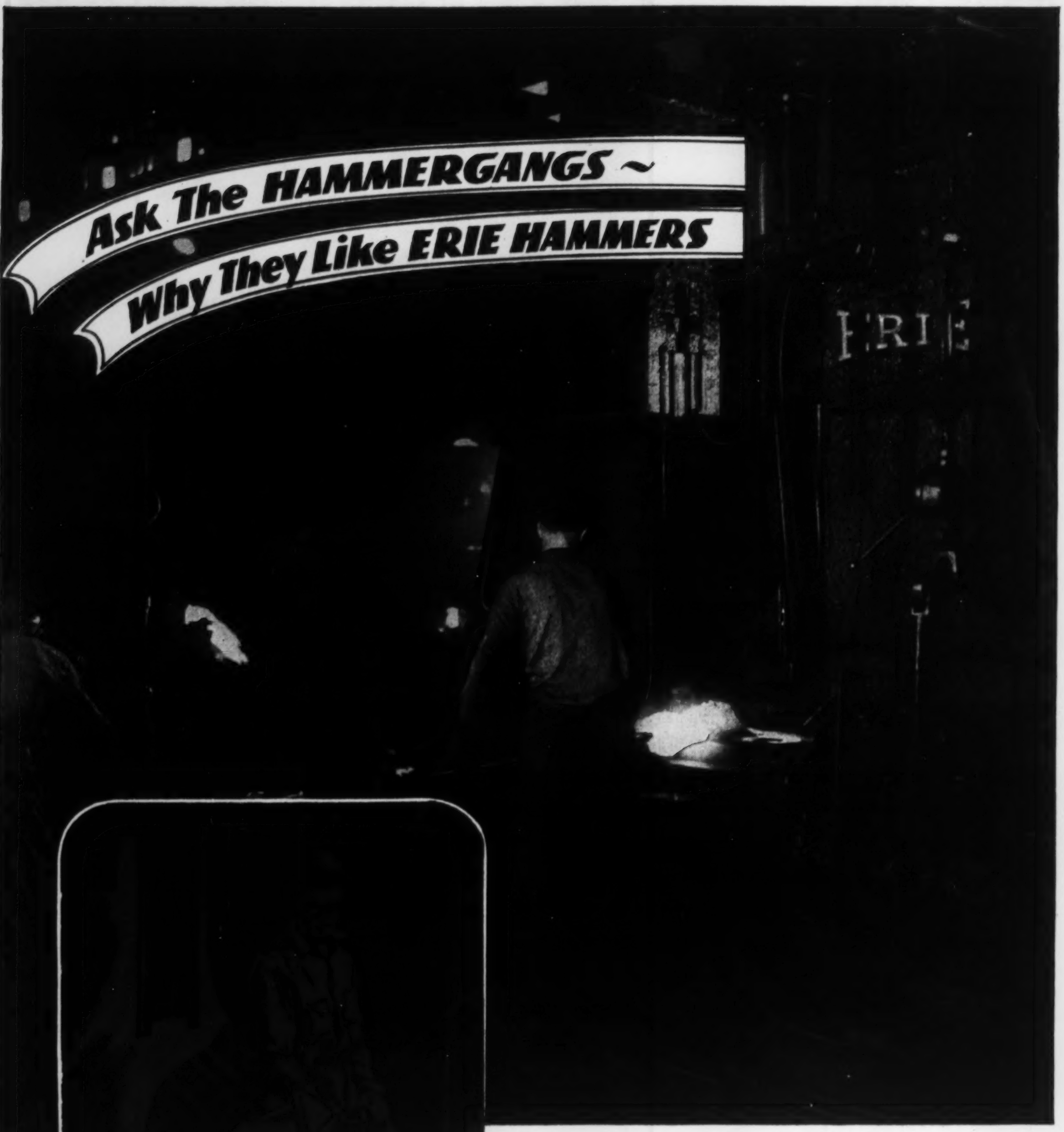
PRODUCTS OF WICKWIRE SPENCER STEEL DIVISION • THE COLORADO FUEL AND IRON CORPORATION

ABILENE • ALBUQUERQUE • AMARILLO • ATLANTA • BOISE • BOSTON • BUFFALO • BUTTE • CASPER • CHICAGO • DENVER • DETROIT • EL PASO • FT. WORTH • HOUSTON LINCOLN (NEB.) • LOS ANGELES • NEW ORLEANS • NEW YORK • OAKLAND • ODESSA • OKLAHOMA CITY • PHILADELPHIA • PHOENIX • PORTLAND • PUEBLO SALT LAKE CITY • SAN FRANCISCO • SEATTLE • SPOKANE • TULSA • WICHITA • *Canadian Representatives At* • EDMONTON • TORONTO • VANCOUVER • WINNIPEG

OTHER CLAYMONT PRODUCTS

Carbon and Alloy Steel Plates • Stainless-Clad Plates • Manhole Fittings and Covers
Large Diameter Welded Steel Pipe • Flame Cut Steel Plate Shapes

2680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Why They Like ERIE HAMMERS
ERIE

A GOOD hammer gang always works better with the rugged, dependable Erie Hammer on the team. On Erie Hammers all stressed parts, upper works, frames and anvils are steel.

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ERIE

ERIE FOUNDRY COMPANY • *Erie, Pa., U.S.A.*

ERIE BUILDS *Dependable* **HAMMERS**

Westinghouse Expands

Assigns more than $3 million for facilities to re-enter room air conditioner field

FACILITIES to produce window-type room air conditioners will be built by Westinghouse Electric Corp., Pittsburgh, at its Appliance Division plant in Springfield, Mass. Appropriation of $3,230,000 for the project comes shortly after an even larger sum went into retooling at that plant. Funds will be used to rearrange and purchase facilities to manufacture the air conditioners. No additional building construction is planned. The plant will have an ultimate capacity of 300,000 units a year.

About $7.5 million will be spent by Westinghouse at Springfield as part of the company's over-all $296-million expansion program, now 75 per cent complete.

Re-enters Field—Under pressure of wartime production, Westinghouse discontinued manufacture of room air conditioners in 1942. It re-entered the field this year to round out its line of major appliances. Manufacturing operations at Springfield are expected to begin by mid-1955.

The corporation also plans to construct a warehouse for its Lamp Division in St. Louis Park, about 4½ miles southwest of the heart of Minneapolis. It is scheduled to be in operation this December.

Machinery Makers May Unite

Package Machinery Co., East Longmeadow, Mass., is negotiating for the purchase of Reed-Prentice Corp., Worcester, Mass., a manufacturer of machinery. The companies will continue as separate operations at present locations.

Robertshaw-Fulton Expanding

Robertshaw-Fulton Controls Co., Youngwood, Pa., is erecting a $2-million plant at Milford, Conn., for its Bridgeport (Conn.) Thermostat Division. The facility will contain 180,000 sq ft of floor space, compared with 95,000 at the present plant. The Milford plant is scheduled to be completed next June; the Bridgeport plant will be sold. The division's chief products are metal bellows and controls utilizing them. Since the first of the year, the company has added, or started construction of, new facilities at Irwin and Indiana, Pa., Anaheim and Long Beach, Calif., and Toronto, Ont.

Dow Opens Magnesium Plant

Dow Chemical Co., Midland, Mich., is recovering magnesium from waste sludge at its Freeport, Tex., plant. The recovery plant removes the light metal from fused and crystallized salts and then casts it into ingots. The new facility is expected to add more than 2 million pounds of metal to the company's annual magnesium production.

Colson Forms Canadian Unit

Colson Corp., Elyria, O., manufacturer of casters and materials handling equipment, organized a wholly owned subsidiary, Colson Canada Ltd., Toronto, Ont. Roy D. Hill is vice president and general manager of the subsidiary; Edward A. Foley, vice president and sales manager. Casters and trucks will be assembled in the Toronto plant and fabrication will be done on many of the company's products.

Aladdin To Make Moe Fixtures

Moe Light Division of Thomas Industries Inc., Ft. Atkinson, Wis., negotiated a manufacturing agreement with Aladdin Industries (Canada) Ltd. It's the first step in a plan to enter the Canadian market. Moe Light's line of lighting fixtures will be manufactured in Aladdin's Toronto, Ont., plant.

Holly Enters Uranium Field

Holly Corp., New York, is entering the uranium business through organization of Holly Uranium Corp. which has purchased two mines in the Grants uranium district of New Mexico. Headquarters will be at Grants, N. Mex.

Smith Buys Four Firms

Ruel J. Smith Enterprises, Warren, O., purchased the assets of three California corporations (Gyro Co. Inc., Motor Equipment Mfg. Co. Inc. and Vonderal Co. Inc.) and an Illinois corporation (Memco Co.). The companies manufacture and assemble motor equipment devices, the chief product being the gyro skid control for passenger cars. Machinery, equip-

(*Please turn to page* 83)

Solar Steel Opens Nashville, Tenn., Warehouse

SOUTHERN metalworking industry has a new source for steel products. Solar Steel Co., Cleveland, opened the doors of its new warehouse in Nashville, Tenn., to a market that consumed almost 11 million tons of steel last year.

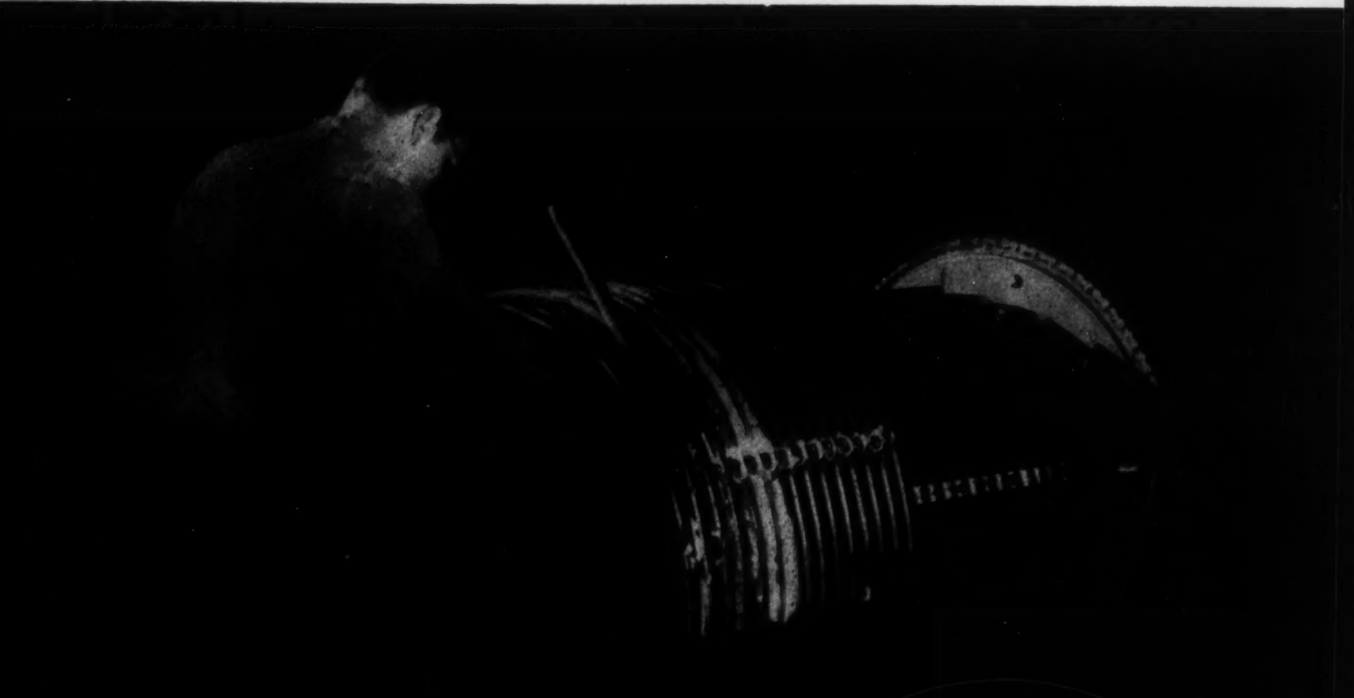
The plant will stock hot and cold-rolled sheet and strip; galvanized and tin mill products; merchant bar quality hot-rolled rounds, flats, squares, angles and junior channels; hot-rolled plates; hot-rolled and cold-finished carbon and alloy bars; seamless and welded tubing; long ternes; drill rod; and tool and maintenance steels.

Processing services run the gamut: Shearing, sawing, slitting, flame cutting, decoiling, tempering, edge rolling, pickling, oiling and packaging. Corrugating equipment will process galvanized sheets.

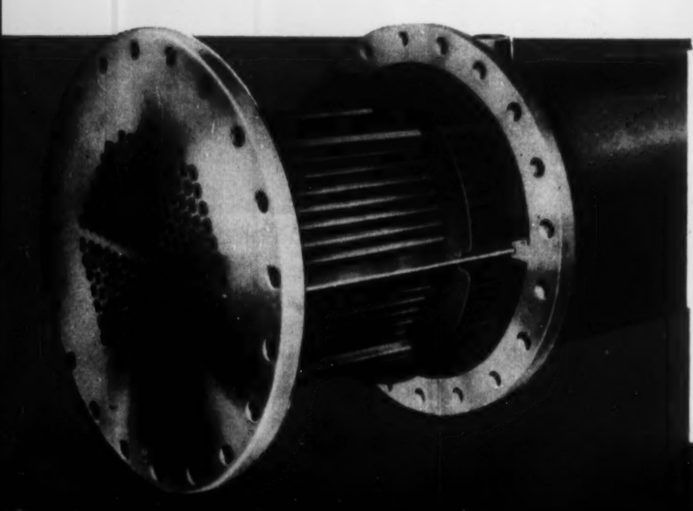
In charge of Nashville operations is A. A. Price, district manager. Mr. Price was a prime mover in instigating barge shipments of steel down the Ohio and Cumberland rivers into the South.

HIGH-SPEED COIL SLITTER

What's the secret of



The secret of strength of tubes for power units and heat transfer equipment is in the NATIONAL Seamless method of manufacture—actually piercing a billet of the finest steel to produce a seamless tube. No welds. No joints. No weaknesses.



The ideal heat-transfer apparatus calls for thin-walled tubes with smooth surfaces that offer the *least* resistance to the flow of heat, yet offer the *maximum* resistance to pressure. The obvious answer—NATIONAL Seamless.

strength here?

STRENGTH of materials is unquestionably the primary consideration when designing modern engineering equipment for power generation, petroleum refining, refrigeration, and chemical processing.

Of all known commercial materials that may be fabricated into pipe or tubes for high pressure applications, none approaches the ideal combination of properties desired for this type of service as well as *steel*—either in unalloyed form, or alloyed with such elements as chromium, nickel, or molybdenum.

The ultimate in strength, however, depends on method of fabrication. In tubular material, the ultimate is reached in NATIONAL Seamless Steel Pipe and Tubes. NATIONAL Seamless is pierced from solid billets of high quality steel, one solid forging with no longitudinal weld. This means absolutely uniform wall strength throughout its length. This is the secret of strength of tubes for all types of pressure units.

NATIONAL Seamless Steel Tubes are not only the answer to high pressures, they are available in suitable analyses for handling a variety of mediums—liquid or vapor, acidic or alkaline, alternate wet and dry, corrosive hot oil or gas vapors, sulphur compounds, organic or oxidizing mineral acids, etc.

For the best possible results at the least cost to you, we suggest you get in touch with our engineers *before* you select new pipe or tubes. Their wide experience with all types of pressure and temperature problems will enable them to find the tubular material best suited to your particular application. If you wish additional information don't hesitate to write: National Tube Division, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

Here's another example of high pressure under control. When these NATIONAL Seamless Steel Bottles for underground gas storage are filled with gas at 2240 p.s.i., there is no room for doubt where wall strength is concerned. Each bottle is subjected to a severe high pressure hydrostatic test before it leaves the factory—insuring the utmost in safety, top performance, and long-lasting service.

NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS · UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS National Seamless Steel Tubes

USS

UNITED STATES STEEL

"Looks like everything you said, Jim"

"This is the spot I was telling you about, Ken. Good cover, good feed, lots of birds, not many hunters. Bill Brown and I got our limits here the other day. Boy, is he a terrific shot!"

"He was telling me about it too, Jim, and it sure looks like everything you said. Bill stopped in yesterday with prints on those aluminum extrusions Wolverine is making for us. Their Tubemanship is even better than Bill's marksmanship. I was certainly impressed with those prints. Did you ever see that Alabama plant of theirs—in Decatur?"

"No, but I've seen the pictures Bill has."

"They don't do it justice. When you see it for yourself you realize why it's called 'the world's most modern tube mill'."

"It's close to your southern branch, isn't it?"

"Less than 200 miles away. We do a lot of business with Bill. Not only in aluminum tube and shapes but in copper and copper-base alloy as well. For us dealing with Wolverine is like having two sources."

"Two sources. How do you mean?"

"Well, their Detroit plant is also one of the finest and we often order our welded steel tube there for our eastern plant."

"Say, that must save a lot of 'shopping around'."

"It does and in more ways than one. We like the completeness of Wolverine's facilities. We use a lot of tubing and they can meet our requirements. Sometimes we order plain tube; sometimes it's finned. Quite often we use their fabricated tubular parts."

"You know, Ken, Bill would get a real kick out of this. Here we are on his favorite hunting grounds talking about his favorite subjects—Wolverine and hunting."

"Terrific, isn't it. Let's be sure to tell him. Just in case he asks we better have some of those ring-neck pheasants to tell him about, too."

• • •

SURE AS SHOOTING: You can count on Wolverine Tube for the finest in copper, steel and aluminum tubing and extruded aluminum shapes. Write—right now—for your copy of the Wolverine Flow Chart. WOLVERINE TUBE, Division of Calumet & Hecla, Inc., 1475 Central Avenue, Detroit 9, Michigan.

EST. 1916

WOLVERINE TUBE
DIVISION OF CALUMET & HECLA, INC.
Manufacturers of Quality-Controlled Tubing
and Extruded Aluminum Shapes

Wolverine Trufin available in Canada through the Unifin Tube Co., London, Ontario

PLANTS IN DETROIT, MICHIGAN, AND DECATUR, ALABAMA. SALES OFFICES IN PRINCIPAL CITIES

EXPORT DEPARTMENT, 13 EAST 40TH STREET, NEW YORK 16, N. Y.

(*Concluded from page* 79)

ment and inventories of these firms will be moved to Ohio, and a new corporation will be formed to replace the former ones.

Lees-Bradner Forms Division

Lees-Bradner Co., Cleveland, maker of hobbing and threading machines, formed a Cri-Dan Division to market and service its Cri-Dan high-speed threading machines. It is headed by Fletcher Gleason, formerly chief processing engineer.

Ajax Electrothermic Expands

Ajax Electrothermic Corp., Trenton, N. J., is expanding its facilities and staff. The addition of a building represents about a 50 per cent physical expansion of engineering and administrative departments.

Norge Buys Range Line

Borg-Warner Corp.'s Norge Division, Chicago, purchased the tools, dies, jigs and fixtures of Leeson Steel Products Inc., a division of Thor Corp., Chicago, for the manufacture of built-in ranges. Production of built-in ranges will continue in Leeson's Bloomington, Ill., plant under the supervision of Norge officials.

Heppenstall Opens Warehouse

Die blocks, die steels, piston rods and piston rod heads for the West Coast's drop forge, press forge and die casting industries are made available quickly by Heppenstall Co.'s new Los Angeles warehouse. Don Madsen and Don Dutton, the firm's representatives there, will maintain offices in the warehouse building at 6440 Fleet St. Equipment includes an 18-in. power hacksaw, a spindle grinder and a portable grinder. Heppenstall, the steel forgings manufacturer, has plants at Pittsburgh, Bridgeport, Conn., New Brighton, Pa., and Indianapolis. In addition to products mentioned, the company makes shear, machine and chipper knives; tinning, galvanizing and back-up rolls; rolled rings; a variety of miscellaneous forgings; automatic and motorized tongs;

NORTHERN **SUPER CRANES • UP TO 150 TONS**

Northern Super Cranes—since 1899—have been moving endless tonnages of material in thousands of plants in the United States and other countries. For safety, durability, precise manipulation, unsurpassed electrical equipment, minimum maintenance and maximum dependability in heavy duty service, many plant managers have installed Northern Cranes exclusively.

Write for Bulletins SE-108-A and G-700

Northern SUPER-CRANES

NORTHERN ENGINEERING WORKS

NORTHERN **HI-LIFT CRANES • UP TO 20 TONS**

Northern Hi-Lift Cranes are intended both to supplement Northern Super Cranes in heavy duty service and to provide economical work handling in lighter service. They have the same engineering features as Northern Super Cranes —low design stress for safety—high grade steels, turned and ground shafts and press fits for durability—highest quality electrical equipment and controls for dependable operation.

Write for Bulletin HL-115-R

NORTHERN HI-LIFT OVERHEAD CRANES

NORTHERN **HI-LIFT HOISTS • 2 TO 15 TONS**

Northern Hi-Lift Hoists are heavy duty type electric hoists, designed especially for low headroom installations. They feature heavy duty roller bearings, extra heavy bearing shafts accurately press fitted with bearing races, extra large independent mechanical and electric brakes, and many other elements required in a good investment in hoist equipment.

Write for Bulletin H-112

Northern HI-LIFT LOW HEADROOM HEAVY DUTY ELECTRIC HOISTS

NORTHERN **TRAVELATORS • FOR LIGHT CRANES**

The Northern Travelator is a bridge drive unit which can be applied to a hand traveled crane to convert it to power travel. It can be easily installed by your own mechanics and electricians in a few hours time. The roller chain drive facilitates installation and provides longer life and greater ability to absorb the usual impacts of crane service.

Write for Bulletin T-105

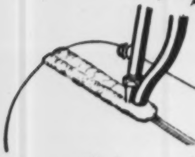
"TRAVELATOR"

NORTHERN ENGINEERING WORKS

NORTHERN **CRANES—HOISTS—TRAVELATORS**

NORTHERN ENGINEERING WORKS
210 CHENE ST., DETROIT 7, MICH.

ARCOS FOR FINEST QUALITY WELDS



New Arcosite flux now makes possible submerged arc welding of stainless

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Hot Overhead

Fourteen different temperature zones are maintained in two huge overhead ovens in Westinghouse Electric Corp.'s new welding electrode plant at Montevallo, Ala. Part of the larger oven (450 ft long) is shown here

sheet and plate lifters; and other materials handling equipment.

Magic Chef Opens New Plant

Magic Chef Inc., St. Louis, has completed arrangements with Taymouth Industries Ltd., Toronto, Ont., for the manufacture and distribution of its products in Canada. A subsidiary company, Magic Chef of Canada Ltd., has been formed and will begin operations at once.

Regulator Firm Buys Heiland

Minneapolis-Honeywell Regulator Co., Minneapolis, purchased Heiland Research Corp., Denver, and will operate it as a division. Heiland makes precision scientific instruments and photographic flash equipment.

Tal-Cooper Division Formed

Panellit Inc., Skokie, Ill., manufacturer of process control, data-reduction and information systems, has formed an affiliation with Taller & Cooper Inc., Brooklyn, N. Y., maker of scientific equipment. The new Tal-Cooper Division of Panellit Inc. will handle marketing and application engineering of Taller & Cooper products. The combination of manufacturing and engineering facilities permits Panellit to cover the full scope of data-reduction and automatic process logging.

Moog Valve Co. Expanding

Moog Valve Co., East Aurora, N. Y., plans to expand its manufacturing facilities in that city. Sales have risen to an annual rate of $2 million.

Townsend Buys Tool & Die Firm

Townsend Co., New Brighton, Pa., manufacturer of rivets and industrial fasteners, purchased West Coast Tool & Die Co., Los Angeles, maker of flexible ejection chutes used in weapons.

McNamara Builds Addition

McNamara & Co., Baltimore, fabricators of steel tanks, are erecting a 5000-sq-ft addition to their plant.

Gets Laclede-Christy Control

H. K. Porter Co. Inc., Pittsburgh, acquired a substantial majority of the common stock of Laclede-Christy Co., St. Louis, producer of a complete line of refractories. Porter is making arrangements to call a special meeting of stockholders, if necessary, to elect its representatives to the board of directors. A majority of the board has been requested to resign.

West Coast operations of Quaker Rubber Corp. and its recent acquisition, Pioneer Rubber Mills, Pittsburg, Calif., will be merged under the name of Quaker Pioneer Rubber Mills Division of H. K. Porter Co. Inc.

GE Refrigerators To Roll

Refrigerators will begin to roll off assembly lines of General Electric Co.'s Appliance Park in Louisville this month. Completion of the $200-million "Park" project is not scheduled until late 1955. Production of electric automatic washers and clothes dryers, ranges, food disposers and dishwashers is being carried on in four other manufacturing buildings. Eventually, all of GE's large house-

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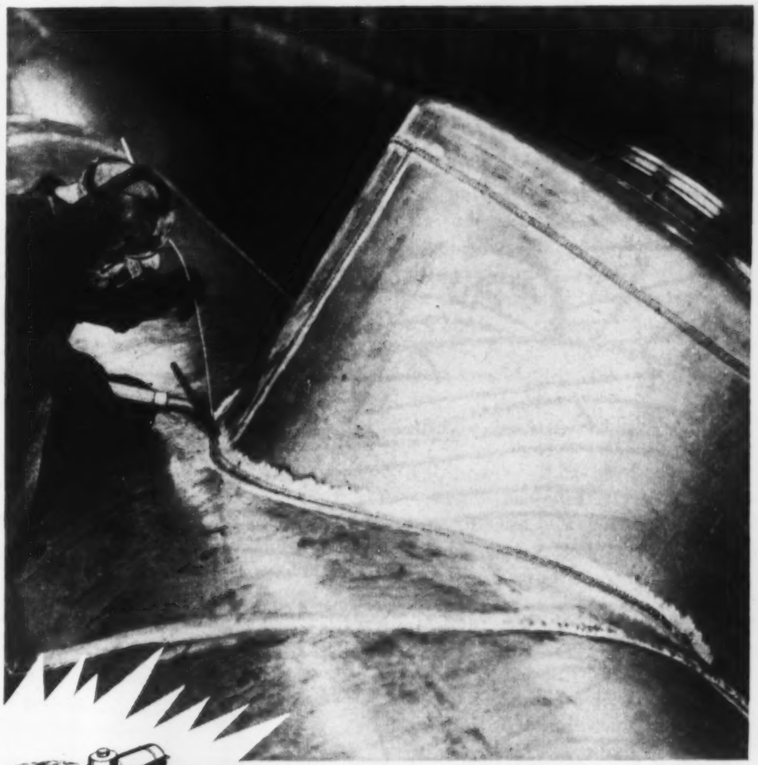

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hold appliances will be produced at Appliance Park. Additional products include water heaters, now being produced in Milwaukee; food freezers, produced at Erie, Pa.; and room air conditioners, produced at Bloomfield, N. J.

REPRESENTATIVES

Kaiser Aluminum & Chemical Sales Inc., Oakland, Calif., appointed Erin Metals Corp., Detroit, as a distributor of its aluminum ingot.

Jones & Lamson Machine Co., Springfield, Vt., appointed L. W. Hodson Machinery Co., Cleveland, as a stocking distributor of its automatic opening die heads, chasers and fixtures.

Parker Appliance Co., Cleveland, appointed several distributors for its hydraulic Hoze-lok fittings and hose assemblies: Rockford Tool & Transmission Co., Rockford, Ill.; Florida Metals Inc., Tampa, Jacksonville and Miami, Fla. Flow Engineering Sales Co., Birmingham, was named distributor of Parker tube fittings and related products.

Hamer Valves Inc., Long Beach, Calif., appointed Shelby Jones Co., Havertown, Pa., its sales representative in eastern Pennsylvania, Delaware and southern New Jersey.

Dravo Corp., Pittsburgh, appointed D. M. Robinson Co., Houston, as a distributor of its heaters and industrial air conditioners.

Allis-Chalmers Mfg. Co., Milwaukee, appointed seven sales representatives of its General Machinery Division to district offices: S. W. Rinn, Pittsburgh; W. F. Bueche, Cleveland; R. M. Thoman, Chicago; R. H. Pritchard Jr., Atlanta; J. D. Vincent, Memphis, Tenn.; W. F. Spanutius, San Antonio, Tex.; J. R. Mills, Beaumont, Tex.

T. W. Allsworth and L. D. Striebel organized Allsworth-Striebel Corp., 53 W. Jackson Blvd., Chicago, to specialize in sales to metalworkers and allied industries confronted with heat-treating, annealing, forging and heat-processing operations. **Gas Machinery Co.**, Cleveland, a principal supplier of such equipment, appointed the new firm as its representative.

McInnes Steel Co., Corry, Pa., appointed Railway & Power Engineering Corp. Ltd., Toronto, Ont., as its representative. The Canadian firm has branches from coast to coast.

Allied Research Products Inc., Baltimore, manufacturer of chromate conversion coatings for nonferrous metals and plating chemicals, appointed Francis B. Bryant as its representative in Iowa and portions of adjacent states. Mr. Bryant's headquarters is at 403 26½ St., Bettendorf, Iowa.

Sales Service Machine Tool Co., St. Paul, appointed Moehlenpah Engineering Inc., St. Louis, as exclusive representative for its Press-Rite presses. Moehlenpah specializes in metalforming, fabricating and processing equipment.

Chain Belt Co., Milwaukee, appointed Stevenson Machine Co. as a distributor in the Cincinnati territory. Chain Belt manufactures chain and chain sprockets, belt conveyors, roller chain and process equipment machinery.

John J. Murphy Jr. and John L. Nolan organized Murphy & Nolan Inc. with offices at 221 Erie Blvd., Syracuse, N. Y. The firm has been named upstate New York representative by several warehouses, specialty mills and shops. These include the following: **Edgcomb Steel Co.**, Hillside, N. J., general warehouse service in steel (including stainless) and aluminum; **A. B. Murray Co. Inc.**, Elizabeth, N. J., and McKeesport, Pa., tubular steel service, including pipe, fittings and fabrication; **SAE Steels**, Cleveland, alloy steel specialists; **Keystone Drawn Steel Co.**, Spring City, Pa., cold-drawn and turned and polished carbon and alloy steel bars and special cold-drawn shapes; **Helical Tube Corp.**, Grand Rapids, Mich., welded and seamless stainless steel tubing up to 1¼ in. OD.; **Posen & Kline Tube Co.**, Norristown, Pa., hypodermic needle and capillary tubing; **Amer-**

(Please turn to page 90)

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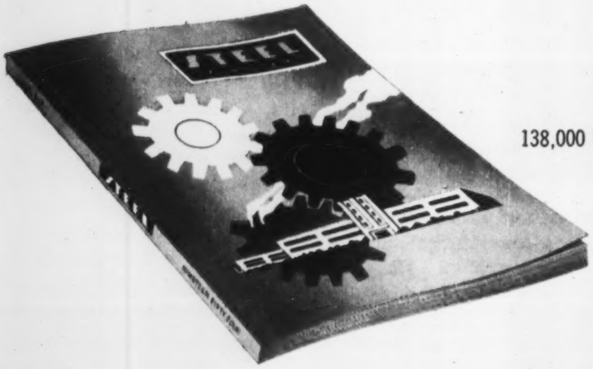

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(Concluded from page 87)

ican Hollow Boring Co., Erie, Pa., hollow boring and deep-hole drilling; **Vulcan Steam Forging Co., Buffalo,** steel forgings; **Brookfield Wire Co.,** Brookfield, Mass., fine steel wire. Murphy & Nolan Inc. also is a distributor of tool and specialty steels produced by **Crucible Steel Co. of America,** New York.

General Electric Co.'s Carboloy Department, Detroit, named Dietz Industrial Supply Co., Aurora, Ill., as an authorized distributor of its products, including standard cemented carbide tools and blanks, carbide-tipped masonry drills and diamond wheel dressers.

Dow Chemical Co., Midland, Mich., appointed Hubbell Metals Inc., St. Louis, as distributor of its magnesium mill products in the central and southwestern states. Other distributors of these products are Reliance Steel Co., Los Angeles; A. R. Purdy Co. Inc., Lyndhurst, N. J.; and Fullerton Steel & Wire Co., Chicago. Hubbell Metals Inc. also distributes copper, brass, steel (including stainless) and aluminum mill products. The firm is equipped for shearing, slitting, leveling, edging and sawing operations.

NEW ADDRESSES

Wagner Bros. Inc., manufacturer of metalfinishing equipment and supplies, consolidated all equipment manufacturing facilities in a new plant at 7800 Dix Rd., Detroit. Operations include fabrication of plating machines, rectifiers, liquid filters, transformers, plating barrels and the construction of steel tanks and linings. The main office remains at 433 Midland Ave., Detroit.

Coats & Clark Inc., Albany, Ga., transferred its engineering department to Toccoa, Ga.

Mathias Klein & Sons, manufacturers of tools and safety equipment, moved their office and factory to 7200 McCormick Rd., Chicago 45. Address for freight and express shipments is 7200 McCormick Rd., Skokie, Ill.

Wabash Mfg. Co. Inc., Baltimore, machine work, is moving into a new plant—15,000 sq ft of manufacturing space, 3000 sq ft of office space. Wabash is one of three separate corporations all under the same control. All are in the 4800 block of Wabash avenue. They occupy in excess of 50,000 sq ft. Other two companies are Danko Pattern & Mfg. Co. and Arlington Bronze & Aluminum Corp.

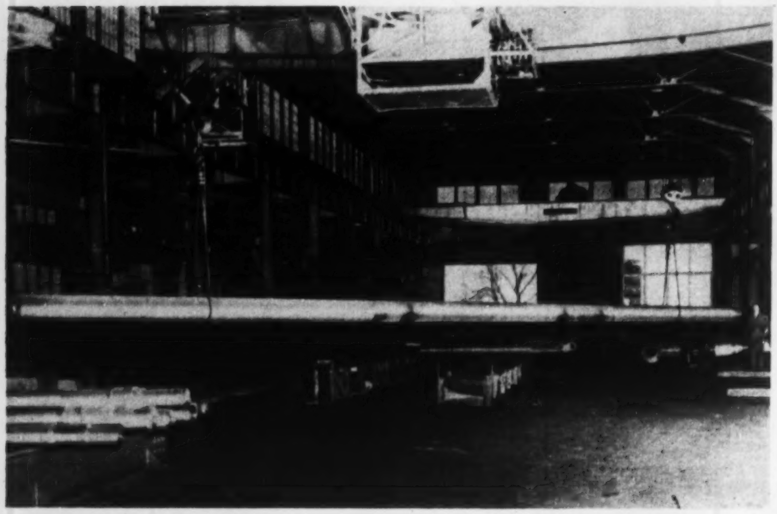
E. V. Nielsen Inc. and **Bass & Co. Inc.,** maker of sheet steel separators, moved their manufacturing, sales and warehousing facilities to 128 Broad St., Stamford, Conn.

Frederic B. Stevens Inc., Detroit, metalfinishing and foundry equipment manufacturer, moved its district office and warehouse to new and larger quarters at 4000 E. 16th St., Indianapolis 7.

ASSOCIATIONS

Samuel Morrison, president, Morrison Steel Products Inc., Buffalo, was elected president of **Pressed Metal Institute,** Cleveland. Vice presidents of the institute are: J. J. Boehm, president, Boehm Pressed Steel Co., Cleveland, and C. Glenwood Rose, president, Judson & Rose Inc., Philadelphia. W. B. Gemmill, treasurer, American Stamping Co., Cleveland, was elected secretary-treasurer.

Members of the board of directors are Mr. Boehm; George Bady, Belmet Products Inc., Brooklyn, N. Y.; R. W. Blackman, Blackman Stamping & Mfg. Co., Los Angeles; C. J. Brunn, Transue & Williams Steel Forging Corp., Alliance, O.; L. G. Castelli, Philadelphia; L. E. Dail, Dail Steel Products Co., Lansing, Mich.; Ray Howland, Eastern Tool & Stamping Co. Inc., Saugus, Mass.; Frank Humberger, Technical Metal Processing Inc., Cleveland; J. B. Kendall, Ford Motor Co.'s stamping plant, Buffalo; John King, Worcester Pressed Steel Co., Worcester, Mass.; J. W. Kootz, S. W. Evans & Son, Philadelphia; Bruce Krasberg, R. Krasberg & Sons Mfg. Co., Chicago; E. T. Nolan, Advance Stamping Co., Detroit; G. N. Schramm, United States Steel Corp., Pittsburgh; R. H. Serrick, Defiance Stamping Co., Defiance, O.; C. E. Stryker, Maysteel Products Inc., Milwaukee; Melvin Verson, Verson Allsteel Press Co., Chicago; Wilfred Williams, Midwest Stamping & Mfg. Co., Bowling Green, O.



Standard Steel Works Produces 62-ft Screw Forgings

One of two 62-ft screw forgings shown at Standard Steel Works Division, Baldwin-Lima-Hamilton Corp., Philadelphia, will become what may be longest screws ever turned. Finished forgings are 16.25 in. in diameter and weigh 44,472 lb. These screws will be tensional members in Lehigh University's new 5-million-lb hydraulic testing machine. Clear space for test specimens is 40 ft high

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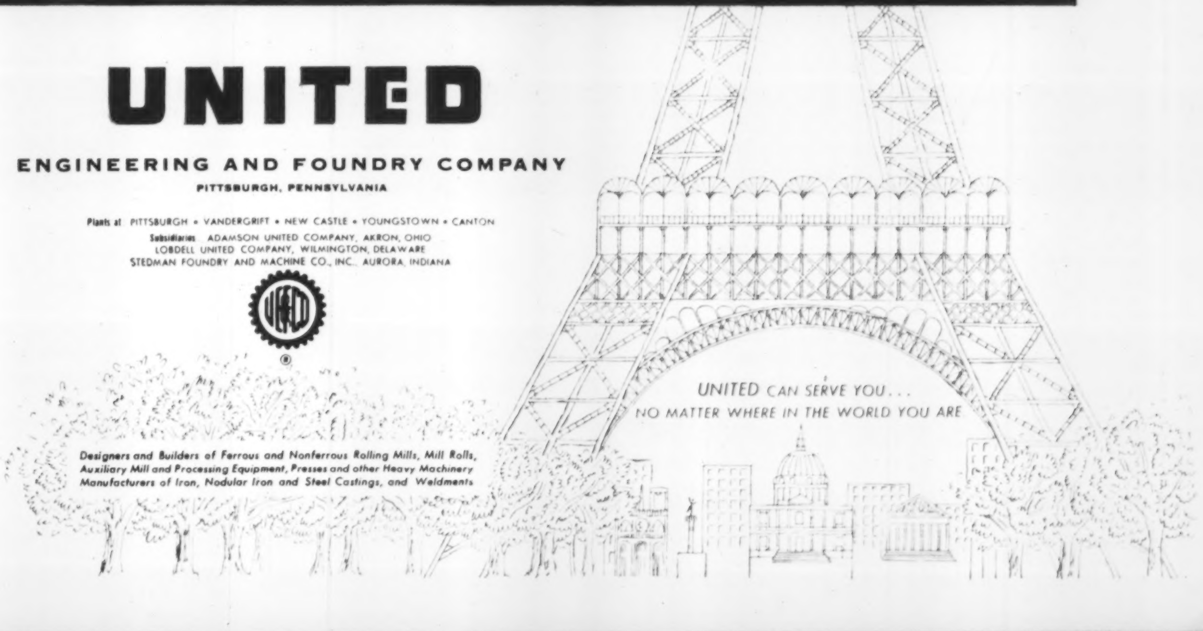
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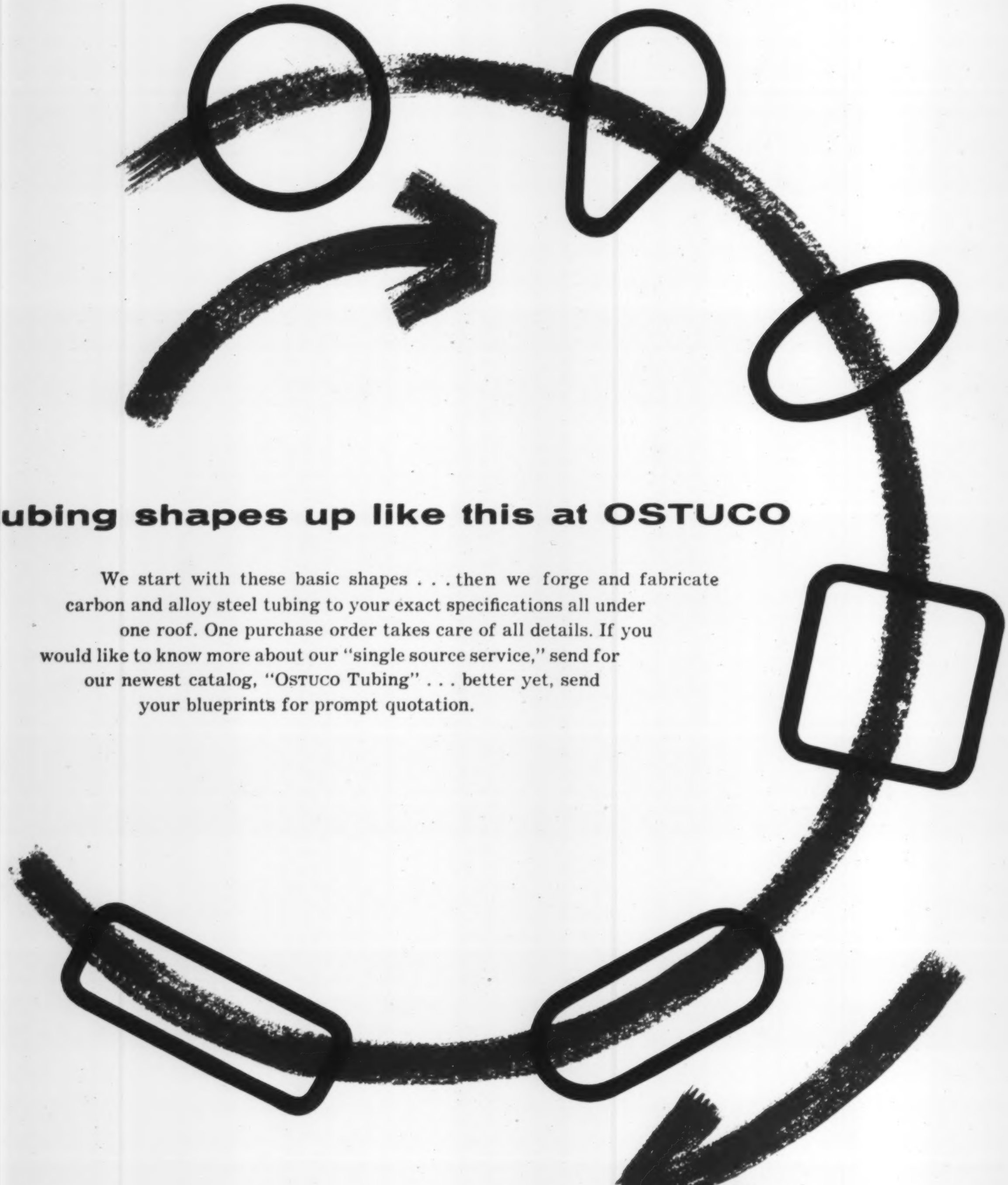

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STEEL
October 4, 1954

Technical Outlook

AUTOMATIC COKE OVENS— Spectacular results are expected from a new remote controlled battery of coking ovens. More than 100 miniature instruments (of the pneumatic type used extensively in the petroleum industry) will be mounted on an 80-ft panel in the air-conditioned control room. It's the first production use of this type instrument in the industry, according to a paper given at the recent ASME instrument and regulator conference, Philadelphia.

DRAWING COMPOUND— Texaco has a drawing compound calculated to prevent caking on dies and knockout or stripper mechanisms. It's water-miscible in ratios ranging from equal parts to 1 to 15 and embodies an effective dispersant additive. The compound was developed to handle work processed under difficult forming conditions and will be marketed nationally in November.

ROCKETS FOR HELICOPTERS— Standard helicopters used by the Marine Corps will get rocket boosters as a result of development by Reaction Motors Inc. The ROR (rockets on rotors) system uses three small rocket engines mounted on rotor blade tips to up effective power 20 per cent, improve rate of climb and hovering ceiling.

WIRED FOR PROFIT— Formed and welded wire is doing a lot of jobs these days that used to be done by stamped and fabricated parts of strip. It has even replaced castings on occasion. As a cost-cutting angle, it's worth looking into.

THE SHAKES— The Navy gives developmental mines, bombs and projectiles 24-hour-a-day endurance vibration tests. Idea is to simulate the worst treatment a truck, railroad car, PT boat, big ship or airplane can give the ordnance items and still have them perform right. The ordnance gets joggled at frequencies from 700 to 3000. Some get the treatment in temperatures ranging from −65° to 180° F. Overtesting leading to costly overdesign is definitely not the purpose says the Navy.

COVERING TITANIUM— Ceramic coatings successfully protect titanium against high-temperature embrittlement. University of Illinois student Herbert R. Toler Jr. reported a vacuum-processed ceramic coating that retarded embrittlement threefold. University of Washington student Frederick H. Simpson got excellent ceramic bonding with oxides of boron and aluminum. Papers on their findings won them prizes in this year's Ferro contest for students.

TUNGSTEN PRODUCTION— Domestic tungsten production is at its highest level since 1944. Tungsten Institute's annual report states 1953 production was 8,991,000 lb of contained tungsten—up 24 per cent from 1952 output. And production in the first half of 1954 is up 42 per cent over the same period of 1953.

MORE CALCIUM BORIDE— Calcium boride is growing in importance as a metallurgical chemical. Electro Refractories & Abrasives Corp.'s sales of the nonmetallic material are up 25 per cent over 1953 figures. Furnished as a grain material for deoxidizing copper and copper-base alloys, the company predicts extensive use in the steel industry as an economic source for boron.

UNWEIGHABLE WEAR — Two University of Michigan engineers used radioactivity techniques to observe gear wear as slow as 50 millionths of a gram per minute. They made their molecule-by-molecule measurements by checking radioactivity build-up in oil used to lubricate radioactive gears. One finding: Extreme pressure oil for high speeds and loads really cuts wear.

Metalworking Outlook—p. 43   Market Outlook—p. 133

Tests Show How

Above is shown an experiment with the hot forming process on a stretch press equipped with a combustion-heated die

EVERYONE working with titanium knows it can be formed, drawn and joined by welding and riveting. He also realizes it has fairly well-defined embrittlement characteristics.

From that point, it takes research to determine the most practical ways to use fabricating techniques. Engineers at Ryan Aeronautical Co. made a study of processes involved in sheet metal fabrication of commercial titanium. Here's a run-down on what they found. It will help you do a better job with the metal.

Forming

In hot and cold forming experiments, Ryan determined that work should have deep forming requirements sufficient to be representative of the most severe aircraft industry problems. For drop hammer work, they selected blanks 0.025-in. thick, ranging in size from 12 x 18 to 20 x 30 in.

Blanks were formed into semicircular cavities with irregular linear centerlines. Some of the stampings have multiple convolutions of both concave and convex proportions with respect to the die surface. Stampings were assembled into a section of an exhaust collector shroud for a helicopter engine.

Parts other than those with shallow draws could not be cold-formed in the drop hammer. Impact caused the parts to fracture in the stage dies after small amounts of deformation. Lubricants did not improve the situation. Another factor is complex allowances required to compensate for springback.

Hot Forming — This technique was successful after procedure development. Initially, sheets were preheated to 900 to 1000°F, then formed on heated steel staging and finishing dies. Mating punches were cast steel, with two of the nine punches electrically heated. Full impact of the 3000-lb hammer was used.

A second procedure called for varying position and number of rubber pads and inching down blank with lighter hammer blows. Both were unsuccessful, the first because of fracture at or below the radiused die edge; the second because it's inadequate for production purposes.

Next step was to apply standard technique for forming stainless steel, using Kirksite dies and lead punches. A mild steel jacket protected punch faces. SAE 250 oil was the die lubricant and heat insulator. This arrangement, with blanks furnace heated to 1000°F, meant forming of satisfactory parts on what is considered a production basis. Temperature of the blank, even when using cold tools, was higher than the hottest die temperatures recorded under the heated die method.

Just Like Stainless—Ryan's conclusion is that commercial titanium sheet can be formed as satisfactorily as its stainless steel counterpart—calling for, of course, judicious selection of edge and corner radii at abrupt contour changes and liberal use of stage dies. It's primarily important to maintain blank temperatures about 700°F. Heated dies are impractical. Use of cold Kirksite and lead tools offers an inexpensive and safe stamping method.

A single pad of forming rubber over the entire blank, with a smaller-pad buildup around the perimeter, produced the best results. As depth of draw increased, the amount of rubber along the edges was reduced. When the rubber pattern was worked out, need for inching the hammer down gave way to full-impact blows.

Oxides from heating, plus residual lubricants, were removed by immersion in an 800°F salt bath, followed by a nitric-hydrofluoric rinse.

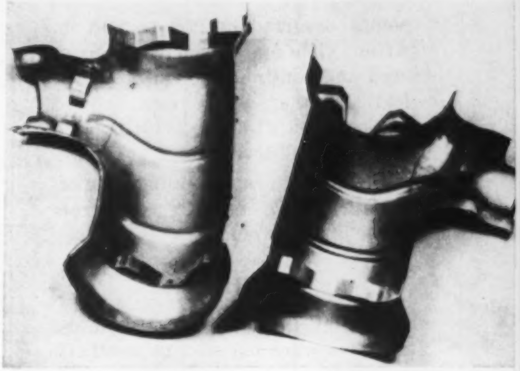
Flanged Parts—Several flanged parts were formed with trapped rubber contained in a heavy steel box attached to the head of a Cecostamp air hammer. Blanks heated to 1000°F were estimated to be 600 to 700°F during forming. A high - temperature rubber pad placed over the blank protected trapped rubber from hot metal. Forming was successful in this setup, but the work showed that titanium has strong resistance to absorption of material in compression flanges.

They also succeeded in heating the titanium blanks 900 to 1000°F electrically by attaching electrodes to the sheets and passing current through them. This method is practical because heating can be done while rubber pads are being placed, saving some heat loss when furnace method is used.

Punch Presses — Forming was done on punch presses capable of exerting 105 tons of pressure. Best results were obtained in forming 0.025-in. sheet using blanks furnace heated to 900°F. The die was heated to 275°F and insulated from

to Fabricate Titanium

Ryan's study points up the factors involved in fabricating titanium sheet. Here is a summary of the project's forming and welding sections, with recommended procedures



Helicopter shroud sections are hot and cold formed, riveted, resistance-welded

the punch press by sheet asbestos.

Cold forming on the punch press requires greater attention to contour forming of blanks to permit metal to flow to proper die contour. As temperatures drop, lubricants become more important. The most successful room-temperature forming was done with copper-plated blanks dipped in a forming lubricant or with colloidal graphite-coated blanks. The graphite is easier to apply, less expensive.

Braking—Titanium strips in several thicknesses — 0.018, 0.040, 0.080 and 0.015 in.—were bent in a press brake with dies of decreasing radii until a fracture occurred to establish minimum bend radii. Whether edges were sheared, milled or polished has no effect on bend test results.

The 0.018-in. material took a 1.7T bend without fracturing. Bands in the longitudinal and transverse directions gave the same results. Minimum bend radii for the 0.040-in. material fell over a wide range: Longitudinal samples 1.66T to 2.35T; transverse samples, 1.95T to 3.90T. For 0.080-in. sheet, minimum bend radii covered 1.96T to 2.35T on longitudinal samples; 1.70T to 2.54T on transverse samples. Longitudinal samples ranged from 1.50T to 2.12T and transverse samples 2.12T for the 0.125-in. material.

Fusion Welding

Ryan's experience showed inert-gas-shielded-arc welding is the only type of fusion welding that can be used to maintain adequate physical properties. Butt welds were made successfully with an automatic Heliarc machine using ⅛-in. diameter thoriated tungsten electrodes and a 5/32-in. electrode distance. A copper tube with ⅜-in. flare outlet was employed to follow up the weld and blanket the hot metal with argon gas to prevent contamination during cooling. A grooved backup bar, which blanketed the underside with argon gas, was used on the underside.

This arrangement consumed 7 cu ft of argon gas per hour for backup needs and 20 cu ft per hour at the electrode. Welds were made at 27 ipm with 65 amp current. Many of the factors pointed up by this phase of the project are not peculiar to titanium, but are also met in stainless and other alloys.

Smooth Fit—Shear cuts must be straight and smooth, and fit must be close—within 0.001 in. on 0.016 material. A poor fit will cause burn-through on light gages. Best backup is a flat copper bar. On light gages, no gas backup is necessary if the material is pressed tightly against the copper backup bar.

In heavy gages, an excessive gap will produce a concave bead surface. A slow welding speed will cause wide bead. Amperage has less effect on penetration than welding speed.

Good quality welds, in which weldments are stronger than the parent metal, were proved by tensile tests that produced fractures outside the weld zone. Bend tests indicated that gas shielding provided good protection and that most welds exhibited adequate ductility. For example, the welds took a 180-degree bend in both longitudinal and transverse directions without failure.

Sigma—In sigma welding, Ryan used 0.125-in. sheet and 0.64-in. wire, making circular passes on one side of each sheet. Welds were structurally sound, with penetrations between 20 and 40 per cent. A 180-degree bend was obtained when the bend placed the bead in compression. A bend placing the bead in tension fractured at 45 degrees, starting at the bead surface.

Original cracks were about 0.007-in. deep, indicating the weld bead may have a contaminated surface that is hard. Such a surface would shatter under tension and create stress concentrations that would lead to failure. All discoloration was removed by processing for 10 minutes in a salt bath at 800° F, followed by 20 minute immersion in a pickling solution.

Resistance Welding

Extreme thick to thin ratios—from 0.025 to 0.125 — were spot welded without difficulty. Investigation of electrodes, pressures and currents indicated lower electrode pressures (800 to 2000 lb) produce a coarse-grained nugget.

At lower electrode pressure, penetration is heavy. One sample averaged 75 per cent, with some cast weld stringers extending about 95 per cent into the parent metal, with 800-lb pressure. At 3000-lb pressure, penetration was 50 per cent maximum, 10 per cent minimum, and there was marked refinement in grain structure.

In tension and shear tests, it was noted in several cases that yield points occurred at 250 to 800 lb. After yielding, specimens recovered and continued to failure. Typical series of shear tests showed values from 2100 to 2340 lb, with 10.4 per cent deviation.

Generally, seam welding characteristics were no different from those in spot welding.

Embrittlement

In embrittlement tests titanium samples were exposed to synthetic exhaust gas atmosphere by sealing them in a heat-resistant alloy cabinet. The cabinet was purged with the gas mixture (85% N_2, 11.5% CO_2 and 3.5% O_2) at 12 liters per hour. Tests were conducted at uniform temperatures between 1000 and 1400° F.

Evaluation—Exposure times varied from 4 to 350 hours. Samples were suspended so no gas impinged directly on the parts. Results were evaluated by band tests.

Little embrittlement occurred at 1000° F, but the rate increased rapidly as the temperature approached 1400° F. Rockwell A hardness readings showed no marked increase in the hardness level, even after exposures at 1400° F where embrittlement was most severe.

At 1400° F, a marked change in adherence of oxide scale was noted. Heating to, or cooling from, this temperature caused the scale to spall off in large flakes.

Riveting and Dimpling

Using ⅛-in. diameter button-head rivets and hole diameters of 0.128-in., first experiments with cold riveting were unsuccessful. The rivets did not swell or spread to fit the holes when standard riveting guns and bucking bars were employed. Flush rivets and pressures of 0 to 5000 lb exerted over one second achieved good results.

Excellent results also were obtained with ⅛-in. button-head rivets, which had been annealed for 20 minutes at 1300° F and driven with 1500 lb force. Further success followed experiments with hot riveting in which ⅛-in. rivets were inserted in drilled sheets of 0.072 and 0.018-in. material and placed in a Federal spot welder.

Titanium: It's Here

If You Can Use It, You Can Get It

TITANIUM has arrived.

If you have a proved or a promising application for titanium—military or commercial—you can get samples or a mill supply of the metal right now. Each of the mill producers reports it has open space, plenty of it, on current order books.

No Longer Little—Titanium sponge output has climbed from a mere 3 tons in 1948 to a little over 5000 tons in 1954. Contracts planned will bring capacity to about 22,500 tons by 1956. It's not unrealistic to look for 40,000 or 50,000 tons of titanium sponge capacity by 1957.

In another sense, however, titanium is still in the process of arriving. That is in the matter of price.

Celestial Stuff—Finished titanium sells for $10 a pound (billet stock) to $20 a pound (certain mill shapes), compared with stainless steel selling for 30 cents a pound to $1 a pound. Few production applications can bear a price of $20 a pound for basic stock.

That is not to say there are no commercial applications now. One that comes close to being a production item is anodizing and galvanizing racks made of titanium wire. Reduced maintenance and longer rack life overcome the price disadvantage. Another promising application is in high speed mechanical parts for calculating machines.

Only the Facts—The fact remains civilian uses absorb only 2 to 5 per cent of titanium mill output. Besides high prices, light commercial usage can be ascribed to the fact that the government keeps saying it will soon have a demand for titanium far beyond productive capacity of the entire industry, thus scaring out prospective civil users.

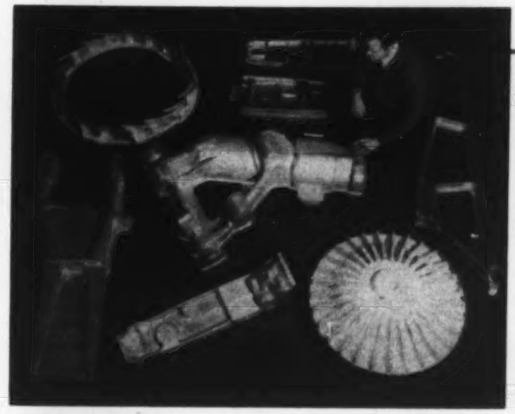
Yet the military hasn't been snatching up all available titanium. About 50 per cent goes to this market. The rest goes to a revolving stock fund, intended to level out the peaks and valleys in production, or to the national stockpile for use in time of emergency only.

More Coming—Despite the fact that the military and commercial markets are not absorbing all the titanium available, the government continues to push for more sponge capacity. E. I. du Pont de Nemours & Co. Inc., will increase sponge output to 3600 tons annually; Titanium Metals Corp. will have a capacity of 3600 tons by October, 1954; Carmet Inc. will install 6000 tons of capacity by mid-1955; and Dow Chemical Co. will have 1800 tons of capacity by July, 1956.

Even that doesn't represent the latest planning on sponge capacity expansion: Electro Metallurgical Co., division of Union Carbide & Carbon Corp., has signed a government contract to build a 7500-ton capacity plant at Ashtabula, O. (See STEEL, Sept. 27, p. 47.)

Paralleling expansion of sponge output, titanium mill product producers are also adding facilities. For example, Rem-Cru Titanium Inc. has a $13-million fast write-off on titanium finishing facilities to be built at Midland, Pa.

With such activity brewing, the day of lower titanium prices can not be far behind. When it comes, look for titanium usage to spring up in the automotive, railroad, chemical and food processing industries.



Aluminum Alloy Adds Umph to Aircraft Forgings

Mechanical Properties of X7079-T6 Forgings

HAND forgings up to 7 in. in thickness:

	Longitudinal			Long Transverse			Short Transverse		
	Tens. Str. ksi*	Yield Str. ksi	El. % in 4 D	Tens. Str. ksi	Yield Str. ksi	El. % in 4 D	Tens. Str. ksi	Yield Str. ksi	El. % in 4 D
Guaranteed Minimum	73	62	9	70	60	6	65	54	4
Typical	77	67	13	73	63	9	71	59	6

DIE forgings up to 7 in. in thickness:

	Parallel to forging flow lines			Other than parallel to flow lines		
	Tens. Str. ksi*	Yield Str. ksi	El. % in. 4 D	Tens. Str. ksi	Yield Str. ksi	El. % in 4 D
Guaranteed Minimum	74	64	10	72	61	4
Typical	78	68	14	76	66	9

* ksi=thousands of pounds (Kips) per square inch

ONE OF THESE DAYS they're going to smack out an airplane at one crack. Already they're forging wing frames, compressor wheels, landing gear.

Better materials bring the "flying forging" closer. Aluminum Co. of America, for example, has just announced an aluminum alloy, X7079, which offers aircraft designers forgings with greater uniformity in heavy sections and increased ductility in crossgrained directions. The company expects the alloy to be particularly valuable in large forgings to be produced under the U. S. Air Force Heavy Press Program early next year.

Forgings First—Present production of X7079, a member of the aluminum-zinc-magnesium-copper series of alloys, will be limited to forgings for which it was developed. But possible use in other wrought products, such as heavy plate and extruded sections, is not being ignored.

Forging characterstics of X7079 are similar to those of 7075 alloy, and sections of comparable design will be available in the new alloy.

The alloy is less quench sensitive than high strength alloy 7075 (75S), making for more uniform heavy sections. Limited tests also indicate that forgings of X7079 may distort less when machined than forgings of 7075.

Mechanical Properties—Fatigue characteristics of smooth and notched specimens are similar to those of 7075. Resistance to corrosion and stress corrosion cracking may be even better.

Advantages are particularly apparent in die and hand forgings heat treated in sections over 3 in. thick. It develops higher and more uniform mechanical properties than 7075 in such thicknesses.

Properties add up to this: Alcoa, for the first time, is able to guarantee mechanical properties in die and hand forgings in section thicknesses up to 7 in. in the solution heat treated and artificially aged condition, X7079-T6.

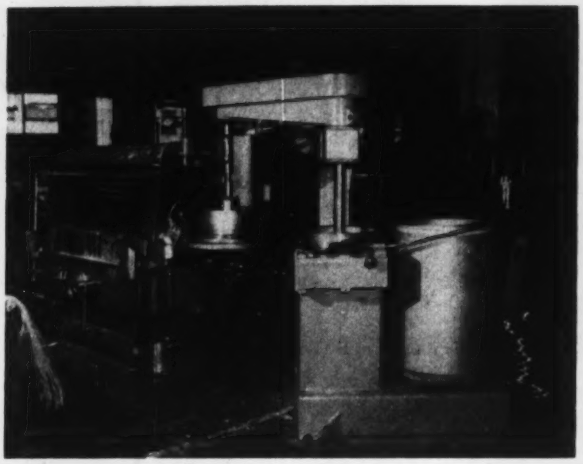
Heat Treatment — Like 7075, this alloy develops optimum mechanical properties after solution heat treatment and artificial aging. Solution heat treat is carried out at lower temperatures than for 7075. Quenching and artificial aging practices are also different. Since X7079 develops high properties in heavy sections, Alcoa intends to produce forgings that are fully heat treated to the T6 temper prior to machining.

Limited tests from hand forgings up to 12 in. thick, heat treated in full section, show that these heavier sections develop tensile and yield strengths only 4000 to 7000 psi lower than sections up to 7-in. thickness. For hand forgings over 7 in. thick, Alcoa will negotiate guaranteed minimum properties for particular sizes on an individual order basis.

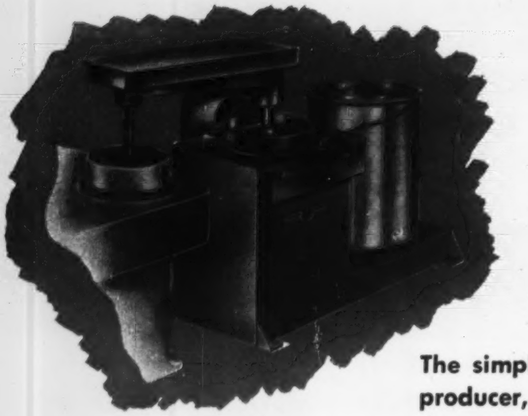
Tests have also shown that the alloy is at least equal to 7075-T6 in resistance to stress corrosion cracking. It has shown longer life than the latter alloy at the higher stress levels.

Machinability—The new alloy is expected to machine much like 7075-T6, but less susceptibility to mass quenching effect, and greater uniformity of mechanical properties should make for more uniform machinability. Limited tests on large hand forgings and die forging shows X7079-T6 to distort less during machining than 7075-T6 and 14S-T6.

WIRE PACKAGING



Here is loading end of drum operation. A Coulter-McKenzie adapter feeds wire from drawing machine to drum



Fiber Drums Pay Off

The simple drum system eliminates dozens of steps for the producer, minimizes downtime and handling problems for the user. It's also a disposable container

ALMOST everyone who makes, ships or uses wire has a stake in the Payoffpak, the plain fiber drum for packaging and feeding, which made its commercial debut last spring.

Driscoll Wire Co., Shelton, Conn., originated the disposable drum-type package, primarily as a way for increasing its fine and specialty wire sales. Manufacturing and patent rights are held by Continental Can Co.

User's View—Advantages to the user are threefold. First, he gets the equivalent of a 500-lb wire coil, which can be handled mechanically from delivery until spotted by a machine. The effect is to bypass a host of previous order requirements brought about by spool bracket sizes, state laws limiting manual lifting weights, etc.

And it means fewer shutdowns. For example, a stitching machine that requires wire delivery in 10-lb spools will be saved more than 50 shutdowns over the course of a single drum load.

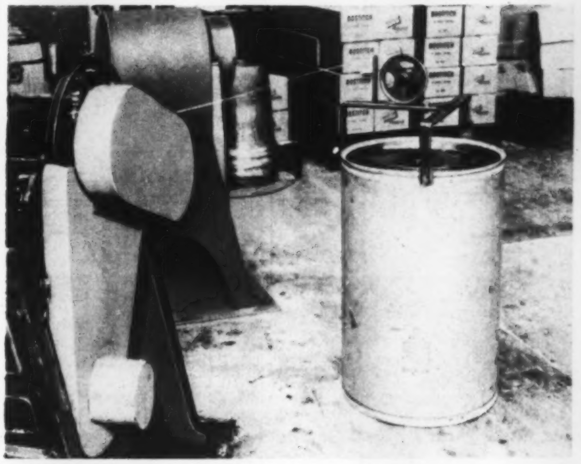
One of the most significant appeals to the user is relatively free payoff. In addition to its method of paying out over the top, the drum's 16-in. loops come off at half the speed of 8-in. coils, giving them twice the time to shake loose.

Producer's Side — Mills benefit because they can automatically pour wire directly into the shipping container. They cut out a series of manual operations between the time the wire is finished and shipped. For example, one of Continental's favorite statistical studies involves an order for 500 lb—fine wire, packed in 25-lb coils, paper wrapped. If the order is drawn in 175-lb coils, the company says it would take 175 operations—100 of them involving manual lifting — to accomplish what can be done by running the 500 lb directly into a fiber drum.

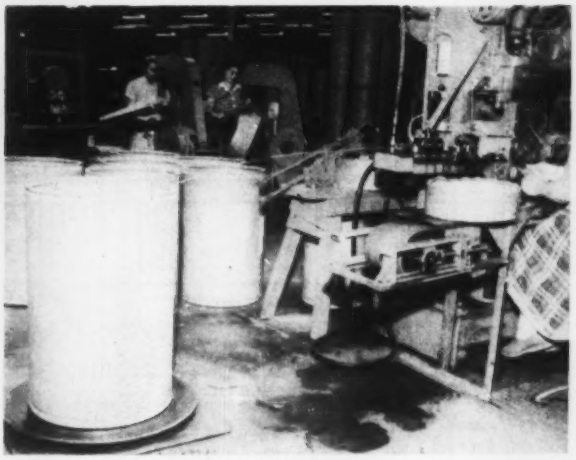
In executing that same order in 25-lb coils, the bare wire is touched or handled at least 60 times. Where steel wire is involved, every contact is a potential rust spot.

Question of Conversion—Biggest problem in putting over the packaging concept is the slow process of selling the producers on the idea. To feed finished wire into the fiber drums requires conversion of existing equipment or purchase of new equipment—a sizable investment for a large wire manufacturer.

Coulter & McKenzie Machine Co., Bridgeport, Conn., makes both the conversion packager and the integrated drawing and packaging machines required. The integrated unit is designed primarily for the specialty wire trade and is built in the entire range of speed, horsepower and die arrangement re-



Wire stitching, like this Bostitch installation, offers a rich field for exploitation of the fiber drum principle



Twist in payoff can be prevented by permitting drum to revolve on a simple turntable. Here it works on No. 11 wire

For Users, Producers

quirements. The conversion unit is simply an attachment that makes wire packagers out of existing wire processing machines. It's synchronized with the machine to which it is attached and feeds wire into the drum without supplemental operation.

By now, most producers have or are contemplating at least trial installations to package wire in fiber drums, leaving the ultimate volume of the product shipped in this manner up to customer response.

Of course, some of the customers are low-volume users who will never have use for 500 lb of wire in one order, precluding complete conversion to drum shipment.

Limits—Pay off of wire from drums can be exactly the same as it has been from coils or spools. If the twist developed in over-the-top pay off is objectionable, the drum can be set on a simple turntable to permit wire tension to revolve it. Where friction devices are used, they can be applied to the drum in exactly the same manner. One result has been higher-speed pay off. Another: Constant drag makes complicated devices to maintain constant tension, avoid whipping, backlash and overspin unnecessary.

Originally, wire cast was important. But modification made cast insignificant in loading the drum and opened it to high carbon wire cast straight and to soft copper that won't hold a cast.

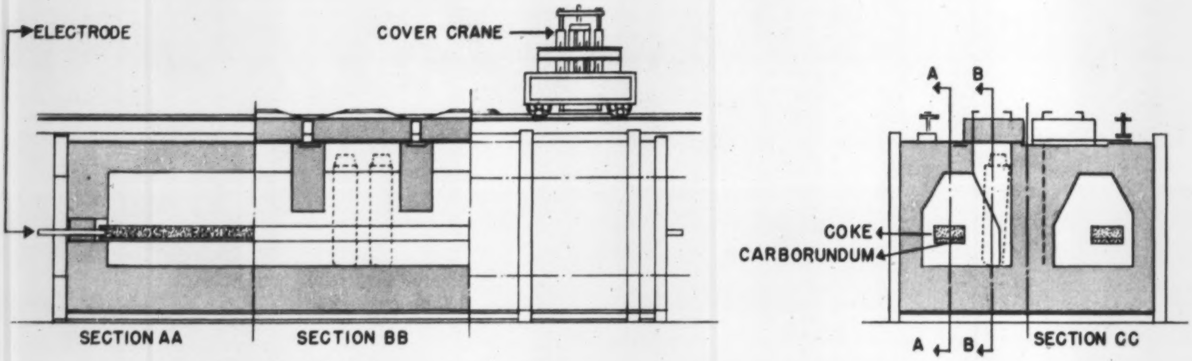
Broadening Applications—Brass drill rod 3/16 in. has been packed successfully, and there's no indication this is the top limit. At the other extreme, 0.017-in. low carbon steel offered no packing difficulty. So the lower limit is probably set by economic rather than technical considerations.

Other types handled successfully include zinc drawn to ⅛-in., and stranded copper vinyl-insulated magnet wire.

Specialties—Some of the specialty wires produced for specific equipment will yield to the greatest savings. For example, welding wire conventionally is sold in 50 or 60-lb coils, although some large users have equipment that takes 200-lb coils. As needed, coils are mounted on reels and lifted into place.

Average machine downtime for coil-change varies from 15 to 30 minutes and a faulty adjustment after changeover can mean a defective product.

Even to convert a welder that uses 50 or 60-lb coils to take 200 lb means a substantial investment in reels, brackets, a hoist, etc. Use of the drum package means 500 lb of wire for each changeover and requires only installation of the simple turntable.

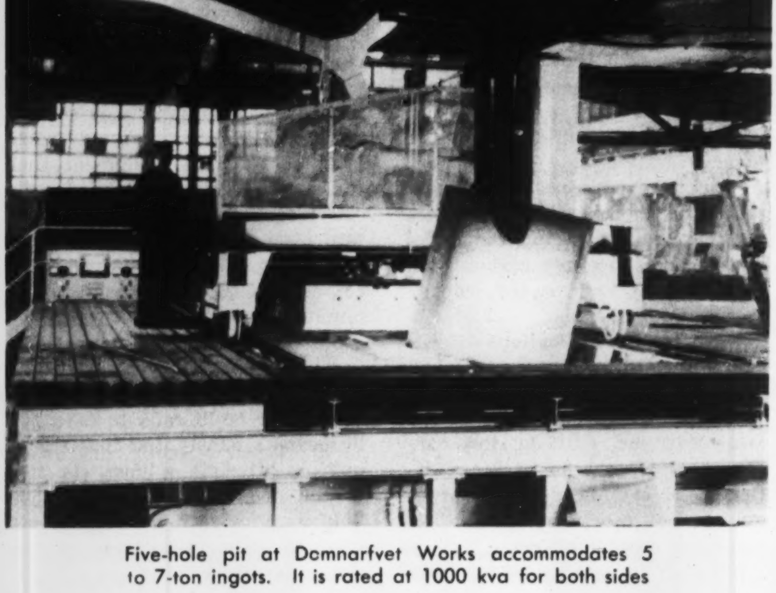


Sections show arrangement of electrodes, coke troughs and ingots in pits

Why Electric Soaking Pits Are Used

They're gaining favor in European steel centers with scale-free operation and ease of control and maintenance. Power demands are not prohibitive in newer models

By HORACE DREVER
President
Drever Co.
Philadelphia



Five-hole pit at Domnarfvet Works accommodates 5 to 7-ton ingots. It is rated at 1000 kva for both sides

ELECTRIC soaking pits, at first limited to Scandanavian steelmaking because of high power consumption, are making their bid in other European steel areas. The most successful type currently was developed by Christiania Spigerverk, Oslo, Norway, who process their entire ingot production through electric pits.

Arc Heated—Essentially, the pit brickwork is contained in a steel casing through which the electrodes are led to connect with the heating elements. These consist of carborundum troughs filled with resistor material, and run the entire length of the pit. Energy is transmitted mainly through radiation, and pit design is such that ingot is heated evenly from all sides.

Contrary to conventional gas or oil-fired pits, individual covers are

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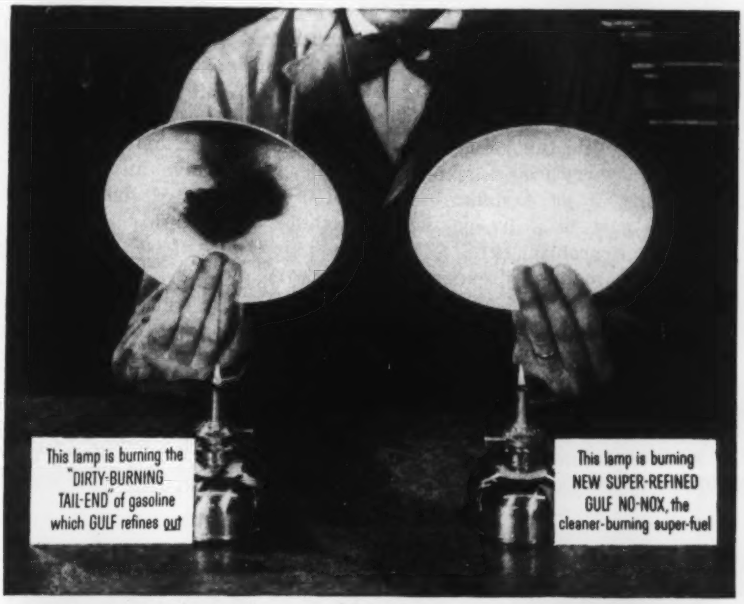
Gulf's cleaner-burning, super-refined gasoline solves today's No. 1 engine problem!


This lamp is burning the "DIRTY-BURNING TAIL-END" of gasoline which GULF refines *out*
This lamp is burning NEW SUPER-REFINED GULF NO-NOX, the cleaner-burning super-fuel

Laboratory tests promised...

. . . these *immediate* and *lasting* benefits from this new, super-refined fuel:

More complete engine protection than from the so-called "miracle-additive" gasolines. Why? Because Gulf refines *out* the "dirty-burning tail-end" of gasoline (the No. 1 troublemaker in high-compression engines)—and then treats this new Super-Refined NO-NOX to give it a *complete range of protective properties*. It protects *every* part it touches against carbon, rust, gum.

Extra gas mileage in all your everyday, short-trip, stop-and-go driving.

No knock, no pre-ignition. Why? Because the anti-knock power of new Gulf NO-NOX has been stepped up to an all-time high.

Stall-proof smoothness. Instant *starts*, too—and fast, fuel-saving warm-up.

That's why new Super-Refined Gulf NO-NOX gives your engine more power-with-protection than you've ever known.

Road tests proved...

These cars, powered by New Gulf No-Nox, actually performed better than new . . . after 15,000 miles!

True! After 15,000 miles per car—covering all conditions of city and country driving—Gulf test cars showed these results:

- Higher-than-new horsepower!
- Better-than-new on gasoline mileage!
- And not a single trace of carbon knock or pre-ignition at any time—even on the steepest mountain grades!

COMPLETELY NEW! SUPER-REFINED

New Gulf No-Nox

THE HIGH-EFFICIENCY GASOLINE

used for each one or two ingots, reducing substantially heat loss when covers are removed during charging and drawing of ingots.

Compact Design—Since there is no need for auxiliary equipment such as heat recuperators or regenerators, the pit is an entirely closed unit requiring little space, low installation and maintenance costs.

Pits in Oslo are built in pairs, having a common wall and a total of 10 covers. Over-all dimensions of the double pit are 30 x 15 x 10 ft, and it will hold 20 ingots (16-in., 4000-lb size). Each half operates on a 400-kva transformer at a near-unity power factor. Each half can operate independently of the other.

Little Scale—One of the inherent features of electric soaking is the sharply decreased scale formation. During the period when a cover is removed for charging or drawing, some of the pit atmosphere escapes, and the entering air combusts surface resistor carbon, inhibiting formation of scale. Scale loss in the pit proper is about 0.2 per cent, and total scale loss, from stripper through the bloomer, is well below 1 per cent.

Coke for the resistor troughs is refilled once a day at a rate of 2 to 3 lb per ton of steel soaked. Troughs are cleaned out every half year and replaced every year.

With a normal utilization of the pits, the average consumption is 150,000 to 200,000 Btu (45-60 kwh) per net ton, at a rate of 50 to 55-000 net tons per double pit per year. At this works, track time is 70 minutes, minimum soaking time 75 minutes, average soaking time 2 to 3 hours; and ingots are drawn at 2150 to 2300°F.

Another Testimonial—At Domnarfvets Jernverk, Sweden, where two double pits are in operation and another three under construction, engineers and operators are enthusiastic. They flatly state that all future pits would be electric even if fuel costs were to treble.

Advantages cited, besides no scale loss, are: Better surface finish, ingots roll more uniformly, and decarb can be controlled. To demonstrate some of these points, the blooming mill was run alternately with ingots from the electric pit and from fuel-fired pit.

MACHINE TOPICS

BY R. F. HUBER, *Machine Tool Editor*

THEY'RE BROACHING STELLITE at Detroit Broach Co., Rochester, Mich. What's more, the machine doing the work is being tooled with carbides to do the job at one of the country's large manufacturers of jet engines.

The part is a jet engine bucket, a problem child well known to many tool experts. It's made of cast Stellite, grade AMS 5382. The entire Christmas-tree root is broached, including the ends, plus another operation on the other end of the bucket. After broaching, the part is ground for finish.

Newcomer — Machine broaching the parts is the first of three. It's a 15-ton, 100-in. stroke, dual-ram vertical surface broaching machine. Cutting speed is variable from 8 to 120 fpm. About 80 ft is now being used on this job, although there's some indication the customer intends to run it at 120.

All broaches for the jet-bucket job have carbide-brazed tips. One spokesman estimates bucket production at about 500 an hour from each machine.

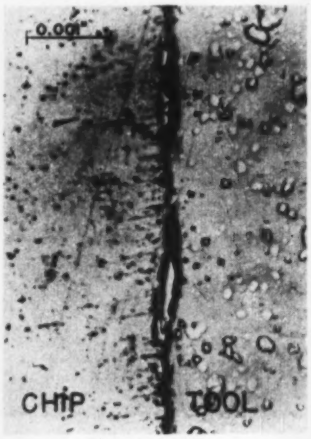
Evolution—Long known as a builder of broaches, tools and fixtures, the company has just made what it feels is a natural move into the broaching machine field. The line of hydraulic machines to be offered includes both single and twin-ram vertical surface machines, vertical pull-down internal and horizontal internal machines. In addition, the management intends to make a full line of light and medium presses.

All products will be made at their plant in the rolling country just north of Detroit. The brand new building (President Gustav Van Reis imported much of the building material from his native Sweden) will have an estimated production of about 5 machines a month. This could be tripled if it became necessary.

The company will continue to produce broaches, fixtures, etc. It's dollar volume is expected to be divided about even between perishable cutters, tools and fixtures, and broaching machines.

Where It Counts

This photomicrograph from Cincinnati Milling Machine Co. is of an actual chip-tool interface. It shows the voids into which the cutting fluid can penetrate. It also shows the areas of metal-to-metal contact. Best device for reducing friction in these areas seems to be the chemical reaction of the fluid with the chip to form a solid film of low shear strength.



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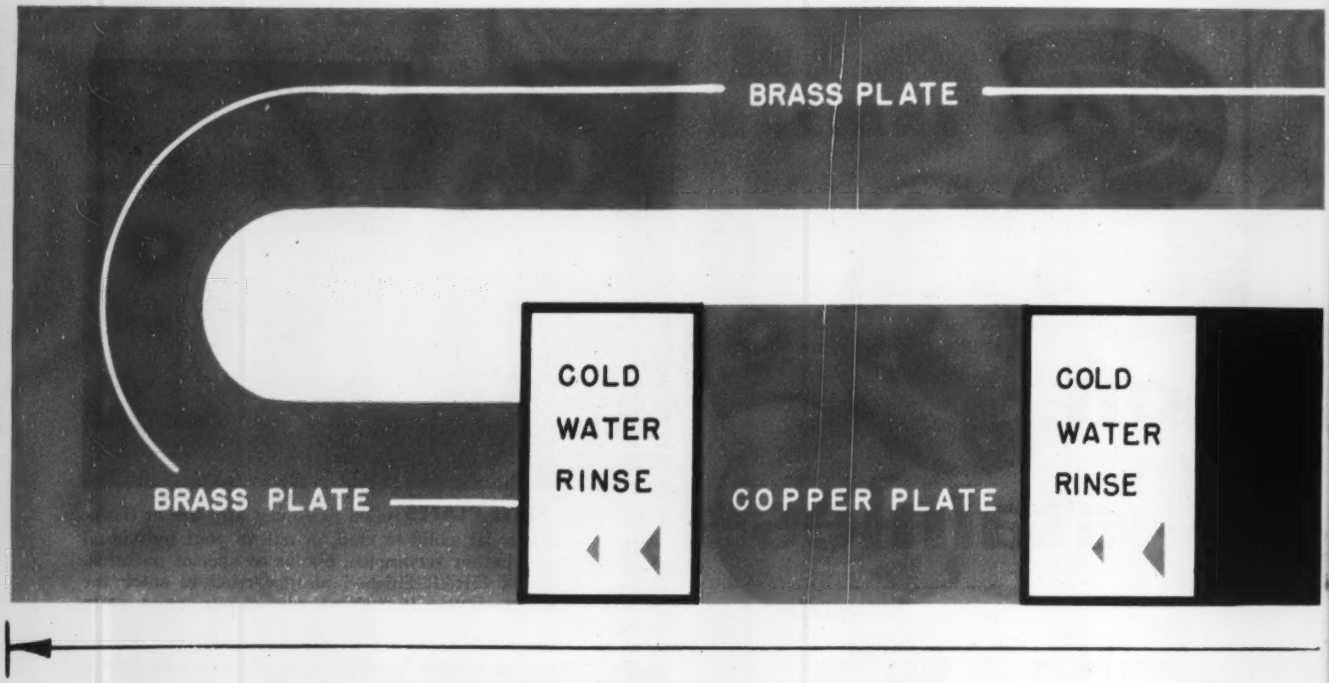


New and old lines are compared in this drawing. You will note that the acid dip has been replaced by a cold water rinse, anodic clean by alkaline deruster

Alkali Replaces Acid

User reports fewer rejects caused by incomplete cleaning and/or plating, equipment is cheaper to maintain and less labor is required to clean and refill alkali tanks

OVER TWO YEARS AGO, acid pickling stations were taken over by an alkaline derusting process on three automatic brass and cadmium plating machines at C. Hager & Sons Hinge Mfg. Co., St. Louis.

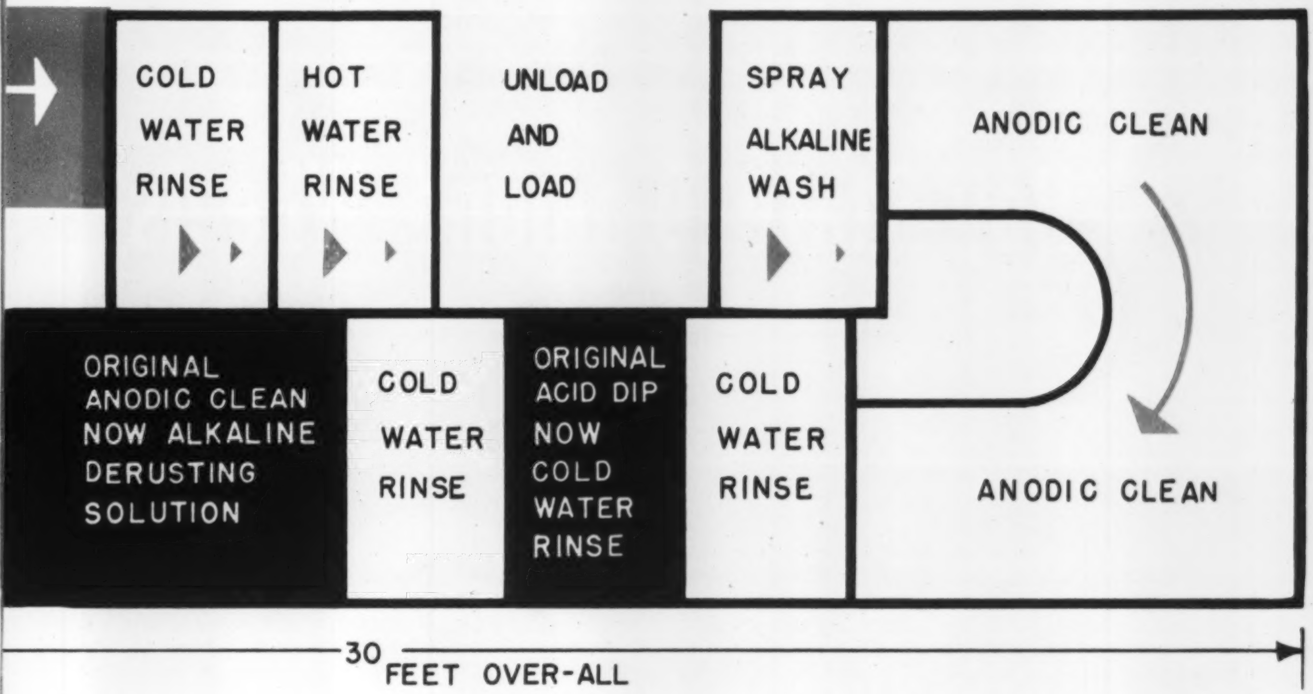
Several long pull economies have been noted, says Andrew Julius, Hager's plating superintendent, including: Fewer rejects due to incomplete cleaning and/or plating, cheaper equipment maintenance and lower labor costs for cleaning and refilling the company's derusting tanks.

A four-month check shows a saving of $43.50 on materials, adding up to a yearly gain of $391.50.

What It Is—Enthone Inc., New Haven, Conn., developed its Alka-Deox 134 process for alkaline or alkali-cyanide plating lines handling iron and steel parts; it shows some promise in acid lines; and is used to remove black scale from iron and steel, although treatment time is lengthened, and, usually, current must be reversed periodically.

Hager had the first automatic application. Other companies are using the process in manual lines for still or barrel plating. One plant, for example, cleans and pickles an alloy steel shaft in 30 seconds to 3 minutes before a copper flash and nickel plate. With muriatic acid pickling, it took 30 minutes to get the same result. An acid concentration over 5 per cent wasn't possible—it produced a smut that could not be removed chemically or electrochemically.

In another plant, the process cleans and pickles bulk work in barrels before barrel zinc and cadmium plating. Water costs are high and waste disposal is a major problem. Savings in water alone are over $7000 yearly. The problem of disposal is limited to a small volume of alkaline cyanide only. One small disposal system carries the load.


COLD WATER RINSE
HOT WATER RINSE
UNLOAD AND LOAD
SPRAY ALKALINE WASH
ANODIC CLEAN
ORIGINAL ANODIC CLEAN NOW ALKALINE DERUSTING SOLUTION
COLD WATER RINSE
ORIGINAL ACID DIP NOW COLD WATER RINSE
COLD WATER RINSE
ANODIC CLEAN
30 FEET OVER-ALL

in Plating Lines

A TYPICAL CYCLE FOR AUTOMATIC PLATING

PROCESS	TIME (secs)	LENGTH OF TANK (inches)
1. Anodic Clean	47	50
2. Rinse & Spray	11	22
3. Enthone Dip	47	50
4. Rinse & Spray	11	22
5. Zinc Plate	443	234
6. Rinse & Spray	11	22
7. Rinse & Spray	11	22
8. Bright Dip	11	22
9. Rinse & Spray	11	22
10. Rinse & Spray	11	22
11. Hot Rinse	11	22
12. Lacquer Dip	11	22
13. Dry	116	62
14. Load & Unload	72	58

Hager Lines—Stations at this company include: 1. Load racks. 2. Anodic clean. 3. Rinse. 4. Rinse. 5. Alkaline derust. 6. Rinse. 7. Cadmium plate and bright dip or copper strike and brass plate.

The solution (used at room temperature) includes 1 lb of the alkaline deruster per gal, plus 10 to 11 oz of sodium cyanide per gal. The racked work is the cathode, at 6 volts and 80 to 90 amperes per sq ft.

The treatment time is 1½ minutes for brass plating, 47 seconds for cadmium. Here the time was fixed by machine design. It is likely that shorter cycles could be used for brass plating, especially if the alkaline derusting solution is at 120° F.

Each machine has extra rinses because design was for soak and electrolytic cleaning, acid pickling and cyanide dipping. The new process eliminates soak cleaning and the cyanide dip. There is no acid surface condition to be neutralized or flash rust (often formed in transfer) to be removed before plating. While rinsing after cleaning remains important, it is a secondary point before cyanide plating with the new compound.

Operation—Laboratory analysis for continuous operation is a once-a-month proposition. Every three weeks these additions are made: Derusting compound, equivalent to 9 per cent of the original makeup; and sodium cyanide, equivalent to 10 per cent of the original makeup.

At Hager, solutions are renewed about every four months (satisfactory results have been obtained after five).

Therefore a solution is discarded when it looks dirty, although it can be filtered and continued in use (with periodic filtration and purification, some plants use solutions up to two years). Hager previously used six carboys of muriatic acid each week.

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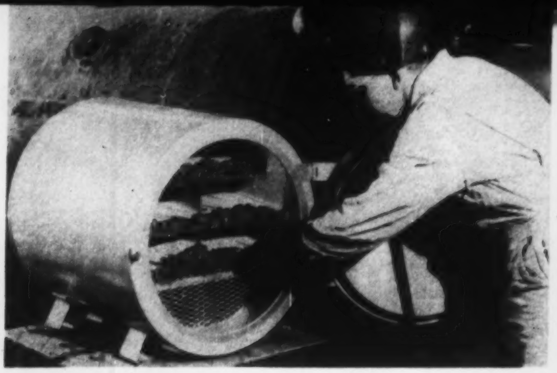


PART II

HYDROGEN

Welding's Big Troublemaker

Part I discussed how and where hydrogen works against the welder. This concluding portion delves into the methods developed specifically to combat the troubles

By HELMUT THIELSCH
Metallurgical Engineer
Grinnell Co. Inc.
Providence, R. I.

SUSCEPTIBILITY of weldments to cold cracking in the base or weld metal depends primarily upon the internal state of stresses in the steel. The major troublemakers are: 1. Hydrogen, 2. restraint and 3. the austenite-to-martensite transformation.

High aerostatic pressures are produced when initially dissolved atomic hydrogen is precipitated as molecular hydrogen as the weldment cools. Shrinkage stresses resulting from restraint further raise the stress level.

Retained Austenite — When steels, even ordinary mild ones, are rapidly cooled from above the critical temperature at which they were fully austenitic, they may retain austenite. It undergoes a delayed isothermal transformation to martensite at atmospheric temperatures on up to about 400°F.

The so-called retained austenite is supersaturated with hydrogen. When this austenite transforms to martensite, microcracking may occur in the newly formed martensite patches due to the embrittling effects of hydrogen in the martensite lattice. Superimposed stresses would further aggravate cracking susceptibility.

Porosity and Cracking—Factors such as composition, structure of base and weld metal, cold deformation, prior thermal history are likely to influence the tendency to retain austenite. Moreover, the presence of hard brittle zones, porosity, segregations of nonmetallic constituents, laminations, etc., may further increase the tendency for cold cracking in the weld or base metal.

Although porosity does not in itself appear to cause cracks, a series of holes in a row may create a line of weakness that often accelerates cracking originating from other causes. Under fatigue loading, porosity may cause cracks, which are of a nature different from the microcracks associated with hydrogen.

Cold cracking, or hydrogen cracking as it is sometimes called, can occur in the weld or base metal. Since the base metal is usually of higher alloy content than the weld material, cracking is more common in the base metal.

Mechanical Properties — Straining is generally associated with the formation and movement of dislocations. Hydrogen atoms, when segregated at the dislocations, are believed to form molecular hydrogen, producing severe aerostatic pressures that may result in embrittlement.

At high strain rates the hydrogen atoms do not seem to have sufficient time to diffuse to the dislocations and form molecular hydrogen. So high strain-rate loading is expected to show little embrittlement; slow strain-rate loading results in maximum embrittlement.

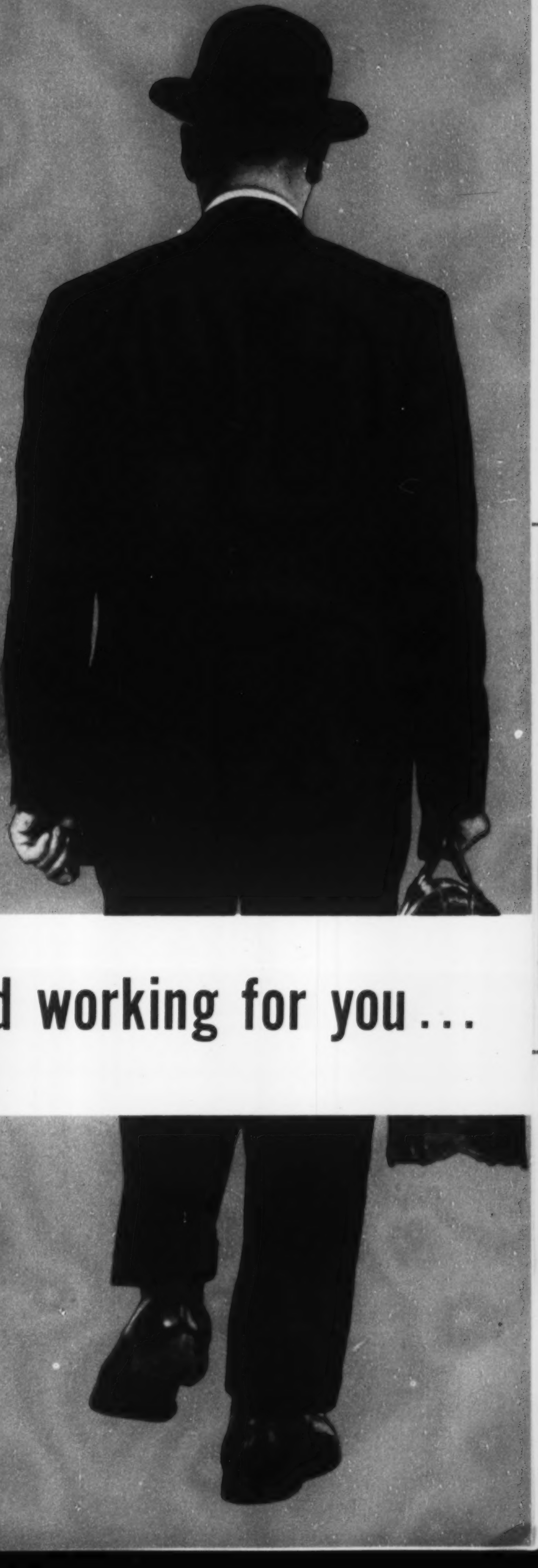
This is verified by impact and tensile tests of steels containing appreciable quantities of dissolved hydrogen. But impact tests show little embrittlement; tensile tests indicate severe embrittlement.

Transition Temperatures — The transition from ductile-to-brittle behavior is slower as the amount of hydrogen in the weld metal decreases.

Those welds from low-hyrogen E6015 and E6016 electrodes usually exhibit a transition temperature about 500°F below that of E6010, E6011 and E6020.

Deposits from E6012 and E6013 electrodes have still higher transition temperatures. The higher transition temperatures are probably related to the presence of the microstrains and microcracking, which seems to be most serious in welds from E6012 and E6013 electrodes.

Fisheyes — Hydrogen embrittlement is also associated with fisheyes that appear on the surface of fractured specimens, bright, granular, crystalline areas on the dull,



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fibrous appearing fracture surface. They represent areas in the steel that failed in a brittle manner.

Cause of the fisheyes is generally related to the severe pressures produced locally by molecular hydrogen, which would result in regions of severe multi-axial stresses. A porosity, inclusion or microcrack is usually located at the center of each fisheye. During cooling, and probably to an even greater extent during straining, atomic hydrogen diffuses into these defects and combines into molecular hydrogen, again setting up severe aerostatic pressures.

Heating at temperatures above 400°F, which would allow hydrogen to diffuse out of the welds, usually eliminates fisheyes.

Effects of Coatings—The amount of hydrogen in weld metal deposited from the different types of commercial electrodes usually varies between limits in Table II.

Table II

AMOUNT OF HYDROGEN IN COMMERCIAL ELECTRODES

A. W. S. Designation	Electrode Type	H_2 cc/100 gm of weld metal	Weight % H_2
E6010	Cellulose	8-22	0.0007 -0.0020
E6012	Titania	7-22	0.0006 -0.0020
E6013	Titania	4-20	0.0004 -0.0018
E6015	Low-hydrogen	0.9-4	0.00008-0.0004
E6020	Iron-oxide	4-16	0.0004 -0.0015
E6030	Iron-oxide	4-16	0.0004 -0.0015

In the absence of pre and postheating in applications where hardenable alloy steels have to be welded with E80XX and E90XX electrodes, the maximum amount of hydrogen that can be tolerated seems to be about 4 cc H_2 per 100 gm of weld metal (0.0004 per cent H_2 by weight). Welds made with E100XX and E120XX electrodes should contain less than 1 to 2 cc H_2 per 100 gm of weld metal (0.0001 to 0.0002 per cent H_2 by weight). Somewhat higher values may be tolerated when preheat and/or postheat treatments are used.

Minimizing Hydrogen — Ideally, electrodes (in particular low-hydrogen electrodes) should be stored under conditions that prevent the absorption of moisture. Hermetically sealed containers, heated storage rooms or drying ovens are the usual recommended procedures. Even hermetically sealed containers may not be satisfactory, and welds deposited from low-hydrogen electrodes immediately upon removal from the container may show pinholes, porosity and cracking.

Electrodes that have absorbed moisture generally must be dried. Drying is particularly important with the medium and high-tensile electrodes, with the more highly hardenable base steels and with a high degree of restraint. The degree of moisture removal necessary depends upon the initial amount of uncombined and combined moisture present, the drying temperature and drying period.

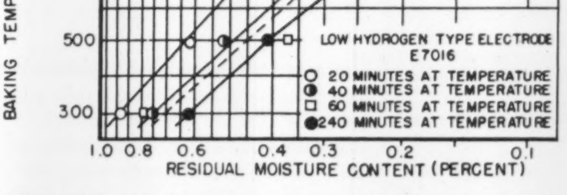
How To Dry—A common redrying schedule for the mild steel and low-tensile alloy steel E70XX electrode type consists of baking two hours at 300°F in a suitable drying oven. It would reduce the residual moisture content in the electrode coating to less than 0.8 per cent, which usually is considered the maximum amount to be tolerated in the low-hydrogen electrodes.

When drying ovens are not available, moist E60XX and E70XX electrode coatings can sometimes be dried by shorting out the arc at standard current settings until steam is no longer given off by the electrode coating. This latter method, however, should be used with considerable care and only when oven drying is not possible. Some coatings are liable to severe cracking and flaking off when this method is used.

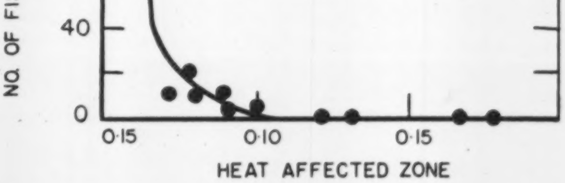
Combined Water—As mentioned, when electrodes are exposed to humid environments, they take on moisture by absorption and chemical combination. To remove combined water, drying for about two hours at temperatures up to 900°F may be required. Drying may be accomplished with many commercial electrodes wthout sacrificing usability characteristics or without causing the coatings to become fragile, crack and flake off.

Ordinarily, such high temperatures are not necessary for the E80XX and E90XX electrodes.

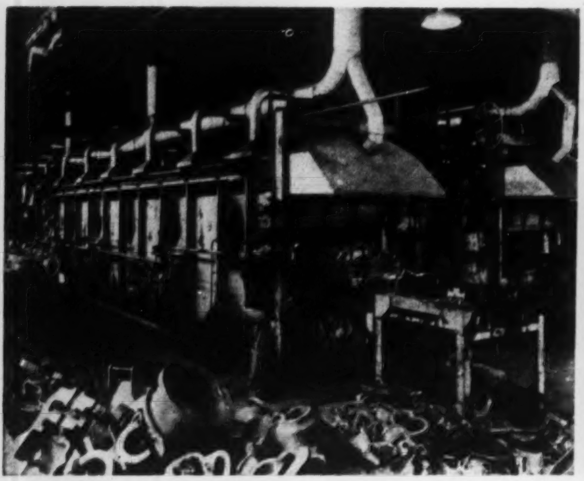
(*Continued on p. 118*)



Effect of time and temperature upon the drying of coated electrodes[1]



Relation between the number of microfissures and the width of the heat-affected zone[2]



Heat treating, as in this continuous furnace, is one of the vital factors covered in the new SFSA specifications

Visual inspection is level specified in new recommended minimum standard to assure required casting quality

New Standard for Steel Castings

SFSA's minimum standard for commercial carbon steel castings is calculated to provide a basis for common understanding among users and suppliers

USERS AND SUPPLIERS of carbon steel castings have a minimum standard to go by for the first time.

Now ready to be put into the hands of users and producers, the standard is the work of the product development committee of Steel Founders' Society of America. Copies are available from the society, 920 Midland Bldg., Cleveland.

Voluntary Acceptance—The society says acceptance will be voluntary on the part of foundries and their customers. It's not the intention to replace other specs in use. Naturally, they emphasize that requirements are minimums and should not prevent production of improved castings.

All clauses of the standard will apply, unless another agreement is reached by producer and user. Here's a rundown on points covered:

Material, Workmanship — Castings shall be free from cracks, shrinkage cavities, hot tears, swells, scabs, blowholes and pinhole porosity that impair utility. External quality shall be judged visually.

Part two of this section adds that castings shall be free from sand and scales on all surfaces—to the extent normal machining operations can be done without further cleaning by the customer.

Detail Requirements—The desirable practice of furnishing a pattern drawing with pattern equipment is noted in the spec. Where this condition is fulfilled by the customer, the foundry assumes responsibility for checking to insure accurate dimensions in the finished casting. Where the foundry gets a pattern without accompanying drawing, its obligation as to dimensions is fulfilled by castings true to the pattern.

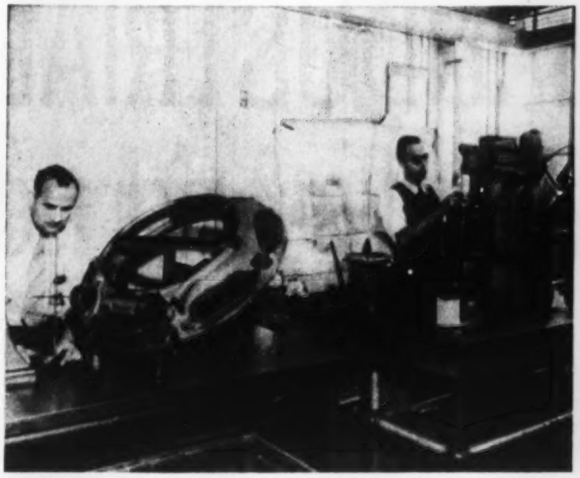
The section on detail requirements also specifies minimum projection and depression that shall result after removal of gates and risers.

Heat Treatment—The spec places particular emphasis on heat treatment. It recommends full annealing, single normalizing or tempering.

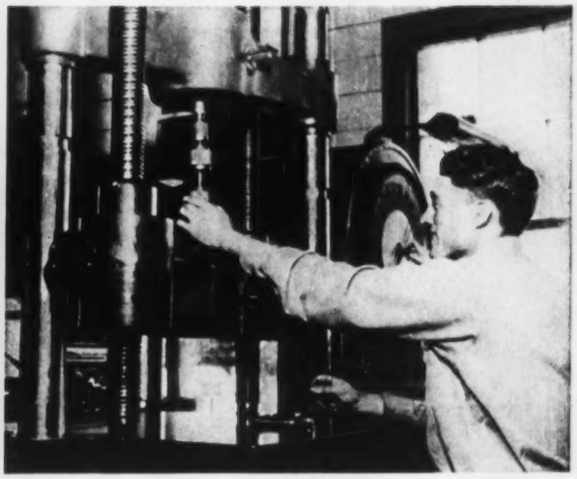
Regardless of type of heat treatment employed, castings shall be heated uniformly to a point above transformation temperature and held there for a sufficient time to refine the grain. Difference between hottest and coolest part of the charge during the holding period shall not be greater than 75° F.

Where full annealing is used, castings shall be cooled slowly in a closed furnace until temperature falls to 1000° F, when they can be removed and cooled in air. In normalizing, castings shall be removed and cooled in air. In tempering, castings can be furnace or air cooled.

Repair of Defects—The standard permits welding of steel castings, whether for repair of defects or addition of other structures, at any point in their processing. But it provides that the defect be thoroughly and completely removed



Standard makes adherence to dimensions in casting, responsibility of the foundry where blueprint is included



Continuous control of tensile strength, yield point, elongation and reduction of area is specified in the standard

TABLE 1

CHEMICAL AND MECHANICAL PROPERTY REQUIREMENTS

Chemical Composition—Maximum Per Cent

C*	Mn*	Si#	P	S	Mo**	Cu**	Ni**	Cr**
0.33	0.70	0.80	0.06	0.06	0.20	0.50	0.50	0.25

*For each reduction of 0.01 per cent carbon under the maximum specified, an increase of 0.04 per cent manganese above maximum specified will be permitted.

#Minimum silicon permitted is 0.25 per cent.

**Total content of these unspecified elements shall not exceed 1.00 percent.

Mechanical Properties***

Tensile Strength Minimum psi	Yield Point Minimum psi	Per Cent Elongation in 2 in.—Minimum	Per Cent Reduction in Area—Minimum
60,000	30,000	24	35

***Mechanical properties shall be determined on the standard 0.505-in. diameter tensile test bar, either with or without threaded ends.

and that the area to be welded be clean and free from sand and scale or other extraneous material.

Welding must be in accordance with procedures stipulated in SFSA recommended practice for welding steel castings.

Quality Control—Procedures in quality control, primarily regarding physical and chemical properties, will govern production under the standard's conditions. Control of these properties implies a need for similar techniques in raw material selection and the processing steps.

The section spelling out methods of sampling, inspection and tests recommends that for lots of 50 or more, where practical, sample castings should be inspected—by destructive or nondestructive tests, to determine if they meet ASTM radiographic standards, E-71, Class Four.

Tension Tests—It specifies that one tension test shall be made from each heat in each lot. Design of the test coupon is to be the standard ASTM test coupon illustrated in ASTM tentative methods and definitions A370-53T.

If any test specimen shows defective machining or develops flaws, it must be discarded and another subsitituted from the same lot. After meeting acceptance tests for ten consecutive heats used for making castings of any one grade, the manufacturer may assemble castings from succeeding melts in groups of five heats each. Castings in each group will be accepted on the basis of one test specimen taken from every fifth heat.

Chemical analysis of all the heats in the group must fall within the range established by the first ten consecutive acceptable heats and all subsequent heats that are physically tested and found acceptable. If this test fails, the heat may be requalified by using another specimen, and the four other heats in the group shall be tested individually.

Specimens—Where more than one heat is poured into a ladle, the heat will be the ladle from which the castings are finally poured. The coupon for mechanical test specimens shall be poured with metal that has received deoxidation treatment identical to that metal from which castings are poured.

One tension-test specimen from each lot is to be tested and must meet minimum properties noted in Table I. If two test specimens from any lot fail to meet minimum requirements, castings can be reheated as often as desired with a coupon from the same heat.

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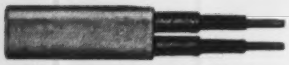

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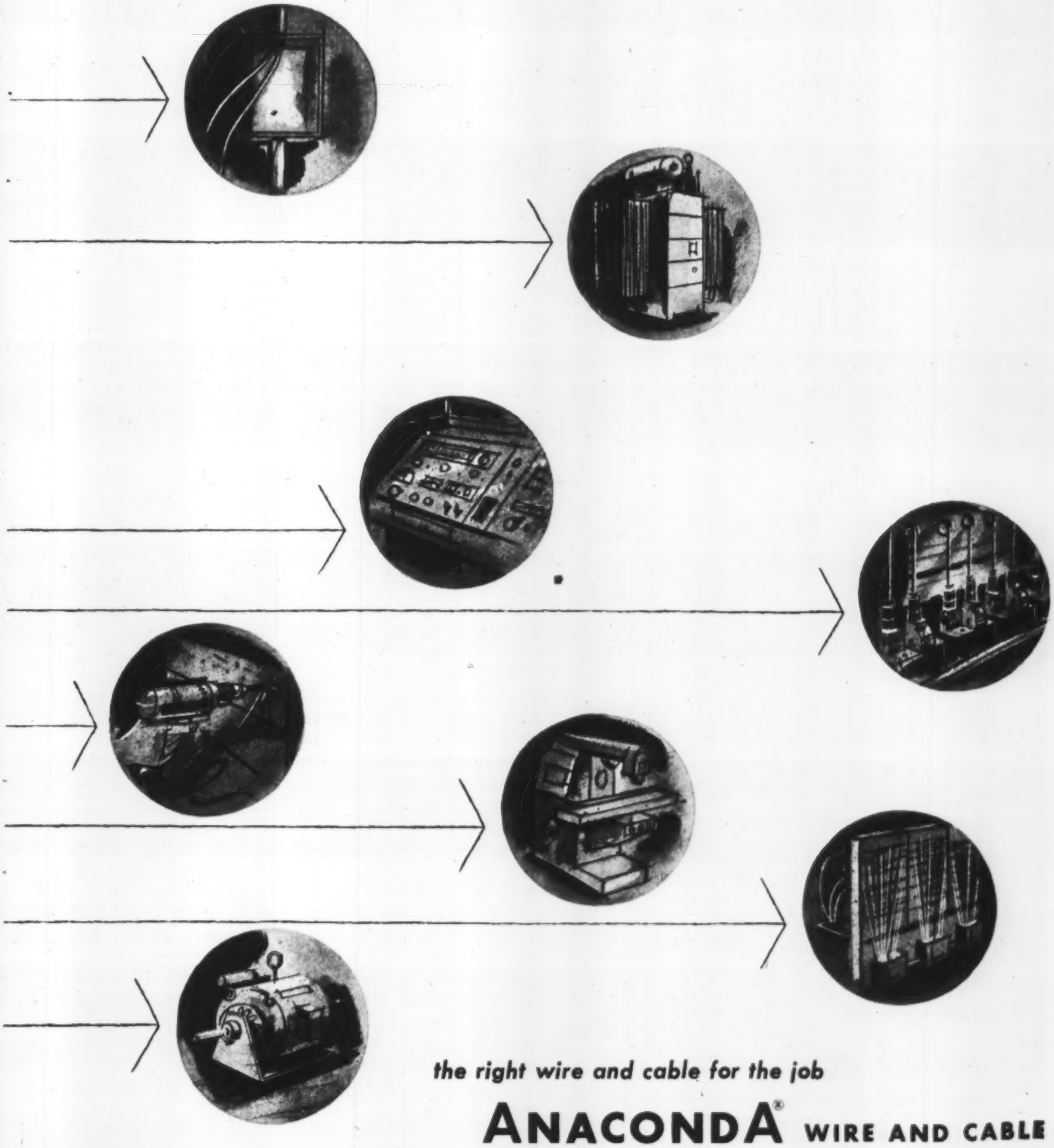

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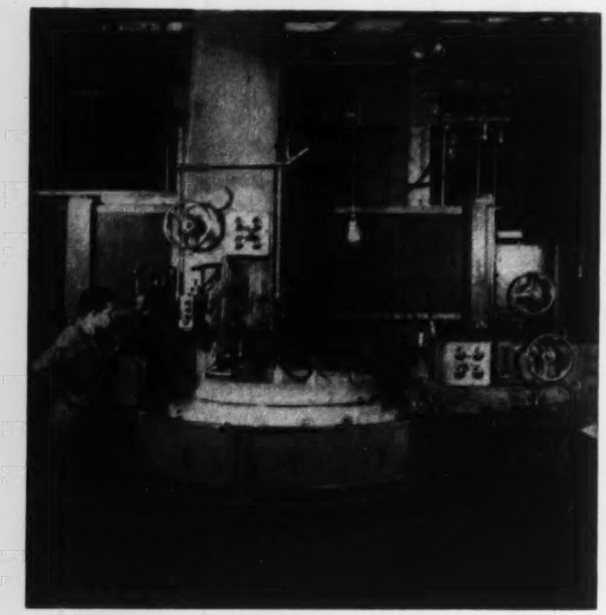


Right grinding time means more pay

AN INCENTIVE PLAN put to work in the industrial bearing grinding department of Timken Roller Bearing Co., Canton, O., upped production and cut costs on bearing races made from forgings.

When these races reach the grinders, they are worth up to $1500 each. Keenly aware of this, operators had a tendency to be overcautious. Production was often less than it should have been.

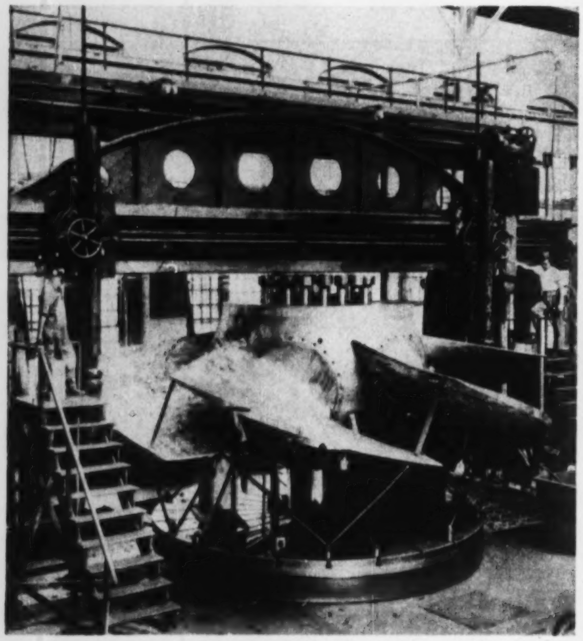
Now each part coming to the grinders carries with it a card specifying grinding time, and the time it actually takes is recorded on a Chronolog that shows performance of each operator and machine.

Incentive—If the operator grinds the part within the prescribed time, he receives maximum incentive pay—otherwise, less.

Overcaution has been replaced by confidence. Accurate measurement now substitutes for judgment acquired through years of experience. Production has increased; operator pay has gone up.

Timken engineers feel maximum production is being achieved without jeopardizing quality. Not one bearing part has been lost to the scrap pile as a result of the grinding operation since installation of the incentive system in April, 1953.

Carbides Slice Machining Time



Rough work at the edges is carbide's meat

MACHINING BLADE end contours on a 165-ton, 23-ft diameter turbine runner could have given S. Morgan Smith Co., York, Pa., a bad time.

No Picnic—Turbine blades were big steel castings. There were 18-8 stainless overlays to cut through and flame-hardened areas where the casting gates had been burned off. The six blades on the turbine meant six interrupted cuts per revolution.

The Sellers boring mill selected for the job was old and its rams were two feet too short. Much of the machining had to be done with the rams fully extended from the ways. It looked like a prize package.

Carbide Wins—In spite of the odds against it, carbide tooling (Carboloy grade 370 tips mounted on SAE 9255 Silman alloy steel shanks) turned out the job in 65 hours. With ordinary tooling 200 hours would have been good. The cut averaged 7/16-in. deep, was made at 1/32-in. feed at 154 sfm. The job was done in three passes—two rough and a finishing cut.

To reach the full depth of the blades, 2-ft extensions had to be fastened to the rams, putting the tools 8 ft from the cross-slide. At this distance chatter was so great that the cuts looked like the tools were playing leap frog. In spite of such punishment, tool runs of 6 to 8 hours were common and one ran for 30 hours without being changed.

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Leading manufacturers throughout the country have chosen Weirzin for the many fabrication economies it offers. They have found Weirzin especially adaptable to deep drawing and forming because the zinc coating remains intact and of even thickness. It does not peel or flake and forms an impervious protective coating, safe from underfilm corrosion. But the economies that Weirzin offers do not stop here. Beneath the zinc coating is Weirton's cold-rolled steel, noted for ductility and uniformity of gauge—assuring you of ease-of-fabrication with minimum rejects.

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HYDROGEN . . .

(Concluded from p. 111)

Only when certain highly hardenable steels are welded with the high-tensile electrodes E100XX and E120XX under severe conditions, as high restraint or subfreezing temperatures, may such high-drying temperatures be required. Ordinarily, redrying for one hour at 500°F should suffice.

Another Means—Welding conditions may be important because factors that increase heat input into the weld metal are beneficial in allowing more hydrogen to diffuse out of the weld metal and out of the heat-affected zone. A higher heat input into the heat-affected zone increases its width, but, in turn, reduces the amount of retained austenite, reduces the hydrogen content, minimizes cracking.

High welding currents, slower rates of electrode travel, weaving and high arc length may reduce hydrogen absorption and porosity, and, in turn, may result in an improved notch toughness and a lower ductile-to-brittle transition temperature. The sulphur-and-selenium-bearing steels are an exception, since porosity tends to increase with higher current.

Preheating—Preheating is the primary method to prevent underbead and weld-metal cracking. Its major advantages are: 1. Hydrogen is allowed to diffuse to less critical zones in the steel and the concentration in the hardened zone is lowered. 2. Austenite-to-martensite transformation occurs at higher temperatures, minimizing the retention of islands of austenite in which hydrogen tends to concentrate, and 3. The shrinkage stresses in the weld metal and in heat-affected zones are reduced.

What Preheat? — Preheat temperatures that should be used depend upon the carbon and alloy content of the steel (its hardenability), the degree of restraint and the type of electrode used. The greater the hardenability and the more severe the degree of restraint, the higher the preheating temperatures should be.

Since low-hydrogen electrodes introduce far less hydrogen into the weld area, the preheat temperatures recommended for ordinary electrodes may be reduced by about 200°F when low-hydrogen electrodes are used; exception is those steels for which the recommended preheat temperature exceeds 400°F. When a steel requires a preheat of 400°F or higher without low-hydrogen electrodes, then the preheat temperatures should not be lowered when low-hydrogen electrodes are used.

Postheat—Further benefits may be gained when the postheat treatment is made immediately upon welding without intermediate cooling, particularly on the more highly hardenable alloy steel grades such as the 5 Cr ½ Mo grade.

Postheat treatments generally serve two purposes: 1. To allow hydrogen to diffuse out of the weldment, and 2. To relieve residual stresses resulting from the welding operation. Postheat treatments between 1150 and 1400° F are most commonly used.

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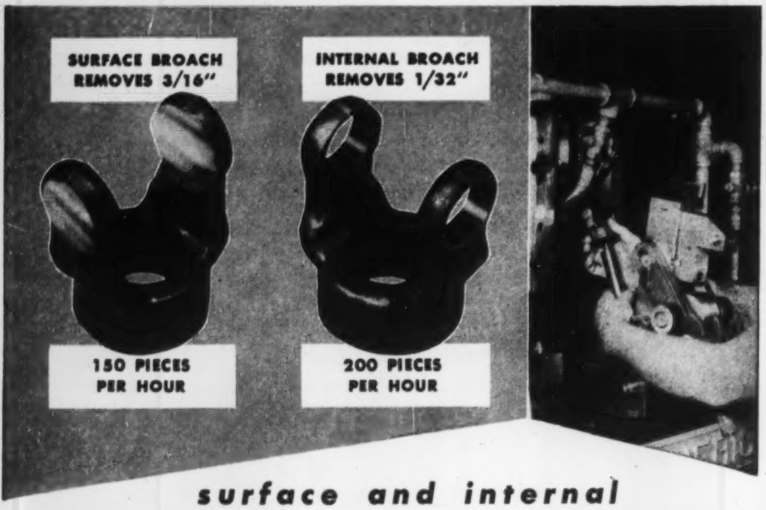
1. E. H. Franks, C. T. Gayley and W. H. Wooding, Journal of American Society of Naval Engineers, 62, 601-619, 1950.
2. E. C. Rollason and R. Roberts, Journal of AISI, 166, 105-112, 1950.

one American broaching machine



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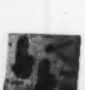

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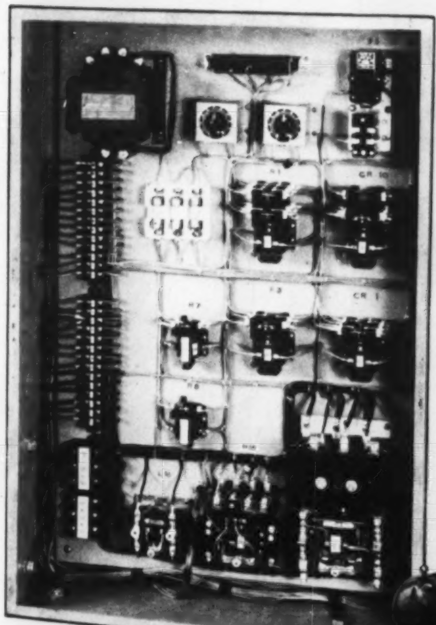
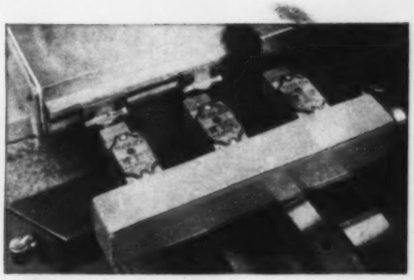
See American First — for the Best in Broaching Tools, Broaching Machines, Special Machinery
SUNDSTRAND

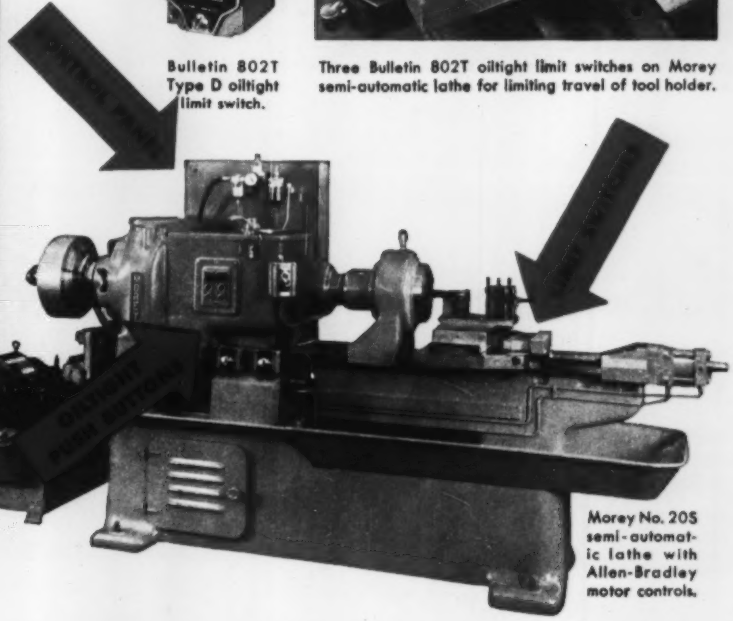


Morey panel built with Allen-Bradley starters, relays, timers, and terminal blocks.

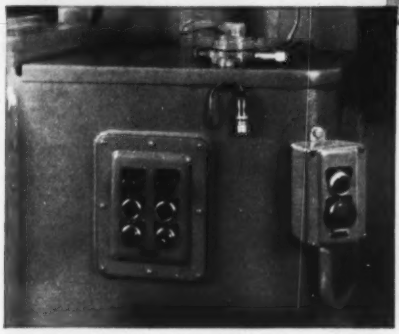
Bulletin 802T Type D oiltight limit switch.



Three Bulletin 802T oiltight limit switches on Morey semi-automatic lathe for limiting travel of tool holder.



Morey No. 205 semi-automatic lathe with Allen-Bradley motor controls.



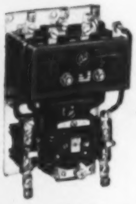
Close-up of Bulletin 800T oiltight push buttons on Morey lathe. They control spindle and pump motors.

Add a Sales Asset to your Machine Tools by standardizing on A-B MOTOR CONTROLS

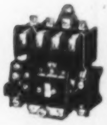
With the growing trend toward AUTOMATION, electric motor controls are items of critical interest to machinery buyers. They recognize the A-B trademark as a label of QUALITY for the Allen-Bradley starters, relays, contactors, timers, drums, limit switches, and push buttons. So, why not standardize on Allen-Bradley motor controls and enjoy the benefits of a prestige line of quality control units? It will not only assure reliable performance of your machines but add another touch of quality appearance . . . a distinct sales asset.

An Allen-Bradley sales engineer will gladly recommend the best combination of controls for the maximum output of your machines. Why not phone your nearest Allen-Bradley office, today?

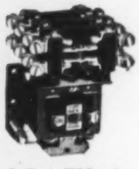
Allen-Bradley Co., 1316 South Second St., Milwaukee 4, Wisconsin



Bulletin 709 Size 2 solenoid starter.



Bulletin 709 Size 1 solenoid starter.



Bulletin 700 solenoid relay—Universal type.

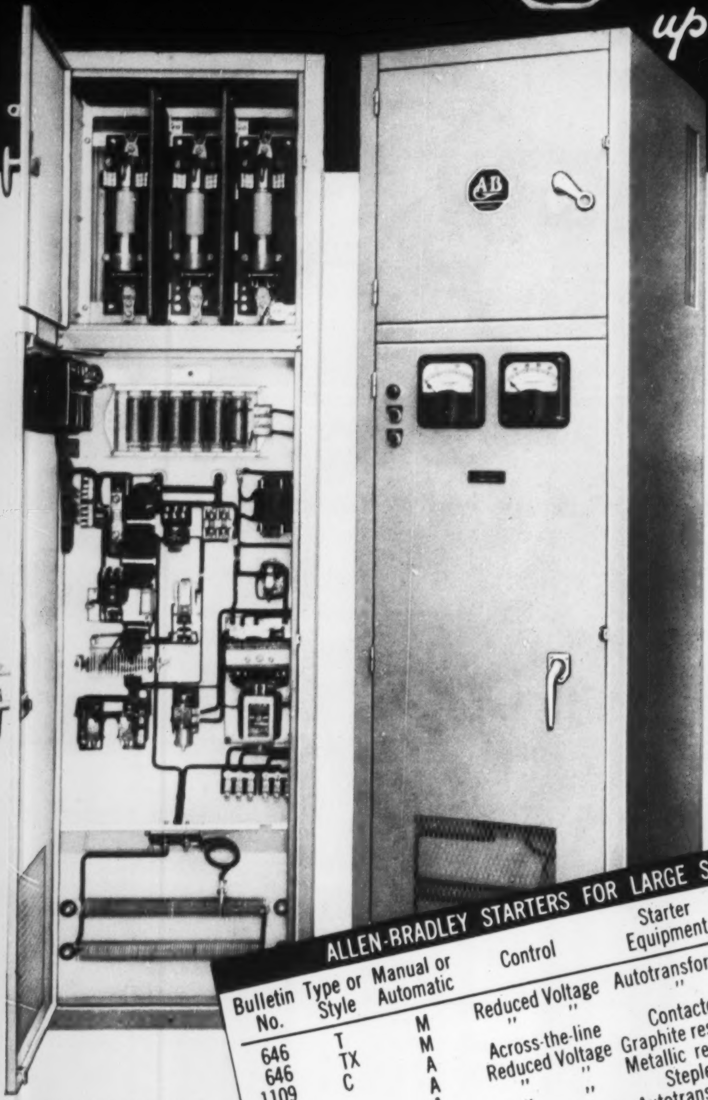
Bulletin 849 pneumatic timing relay.

ALLEN-BRADLEY
QUALITY
MOTOR CONTROL

A-B
Quality

8-54-R

LIFETIME STARTERS *up to* 1500 HP



Bulletin 906 Style C high voltage synchronous motor starter with current-limiting fuses. Self-protecting against short circuits up to 150,000 kva on 2500 volts or 250,000 kva on 2501 to 4600 v. The high tension, solenoid operated, across-the-line oil-immersed switch is mounted in oil tank behind the panel. Cabinet has hinged doors on front and back.

There are 14 different types of these rugged Allen-Bradley starters. (See listings below.) Some are of the across-the-line type . . . but most of them are reduced voltage starters using resistors, transformers, or reactors during the starting period.

These starters are available in 2500 to 4600 volt ratings for squirrel cage motors from 700 to 1250 hp, and for synchronous motors from 800 to 1500 hp. They are listed for squirrel cage motors from 125 hp, 220 v to 600 hp, 440-550 v, and for synchronous motors from 350 hp, 220 v to 700 hp, 440-550 v.

For complete details, please send for the A-B Handy Catalog.

ALLEN-BRADLEY STARTERS FOR LARGE SQUIRREL CAGE MOTORS

Bulletin No.	Type or Style	Manual or Automatic	Control	Starter Equipment	Maximum Horsepower at Rated Voltage			
					220V	440-550V	2000-2500V	2501-4600V
646	T	M	Reduced Voltage	Autotransformer	125	250		
646	TX	M	" "	"			700	1250
1109	C	A	Across-the-line	Contactor				
740		A	Reduced Voltage	Graphite resistors	200	200		
741		A	" "	Metallic resistors	300	600		
742		A	" "	Stepless	300	600		
746		A	" "	Autotransformer	300	600		
1146	CT	A	" "	"			700	1250

ALLEN-BRADLEY STARTERS FOR LARGE SYNCHRONOUS MOTORS

Bulletin No.	Type or Style	Manual or Automatic	Control	Starter Equipment	Maximum Horsepower at Rated Voltage			
					220V	440-550V	2000-2500V	2501-4600V
906	A	A	Across-the-line	Contactor	350	700		
906	C	A	" " "	"			800	1500
914		A	Reduced Voltage	Resistors	250	250		
922	AT	A	" "	Autotransformer	350	700		
922	CT	A	" "	"			800	1500
922	CR	A	" "	Reactor			800	1500

8-54-R

Allen-Bradley Co.
1316 S. Second St., Milwaukee 4, Wis.

ALLEN-BRADLEY

TROUBLE FREE MOTOR CONTROLS

QUALITY

Plating Barrel Conveyor

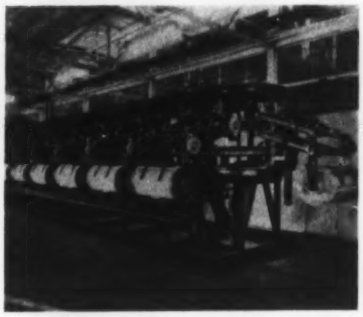
FULLY AUTOMATIC, return-type conveyor and standard Udylite horizontal barrel plating machine unit can be adapted to any standard plating process.

Utilized for the zinc-plating process, a typical machine has 24 cylinders, 14 in. in diameter by 30 in. long inside dimensions. It is set to produce 3000 to 5000 lb of plated work per hour.

Heavy Duty — The machine is rigidly constructed using a maximum fiber stress of 10,000 lb psi of pressure.

Timer-controlled speed and power operated skip transformers make the machine flexible. Rpm of cylinders can be changed.

The cylinders are capable of individual lowering or raising and are easily removed. Operating mechanism is so engineered that only the vee-belt drives, which will not rust, are over the machine.



CONVEYOR AND PLATING BARREL
. . . adaptable to any standard process

The cylinders rotate when lowering, greatly reducing drag-out losses and solution contamination. Separate chains for the elevating eliminates stress on the conveyor chain.

Operation—The machine is electrically and mechanically operated. It may be left in the up position indefinitely. A power-operated hopper, with weighing scale, is used to button-load.

After unloading, plated work is dried in standard drum type drier, or centrifuge. The machine may be equipped with heated air operated chutes, electrically controlled to dry work.

CASE No. 388
**Metal Working Plant*

$16,000 SAVED YEARLY

on installation which paid for itself in less than one month

Savings include:

(a) 50% Saving in effort

(b) 50% Saving in space

(c) 10% Saving in scrap

**Customer's name on request*

Equipment like Logan Conveyors can make the difference between profit and loss for many plants, in the COMPETITIVE days ahead. Why not have a look at the Logan K-E-Y book describing cash savings in production, warehousing, receiving and shipping in plants large and small.

Write Today
for booklet showing what Logan equipment is doing for plants like your own (Booklet K-E-Y).

LOGAN CO., 535 CABEL ST., LOUISVILLE, KY.

Logan Conveyors

THE BIG LIFT

350-TON

Alliance

LADLE CRANE

HANDLING

510-TON

TEST LOAD

Alliance Cranes handle the world's largest loads with ease. This 350-ton, 4-girder, 60-foot-span ladle crane, equipped with a 60/25 trolley, is one of two delivered recently to a Midwest steel company for open hearth duty. The photo shows it handling a 510-ton test load.

The 24 track wheels on the bridge are spaced to obtain equal loading on each wheel. The trolley rolls smoothly on 16 track wheels arranged to provide transverse and longitudinal equalization.

The operator's cab is air conditioned.

Alliance Cranes are as safe as they are big. They have to be. The crane pictured here is equipped with laminated ladle hooks, safety rope reeving, interlocked drums and synchronized worm drive. The hoist gearing is so proportioned that the full capacity of the crane can be lifted by one motor without exceeding the quarter-hour rating. These time-tested safety devices were developed and engineered by Alliance.

When you face your next big lifting problem, discuss it with Alliance. Alliance will help you reach an efficient, economic solution.

World's Largest Builders of the World's Largest Cranes

THE ***Alliance*** **MACHINE COMPANY**

Main Office: Alliance, Ohio *Founded 1901*

LADLE CRANES • GANTRY CRANES • FORGING MANIPULATORS • SOAKING PIT CRANES • STRIPPER CRANES • SLAB AND BILLET CHARGING MACHINES • OPEN HEARTH CHARGING MACHINES • SPECIAL MILL MACHINERY • STRUCTURAL FABRICATION • COKE PUSHERS

Give Us The Runway And We'll Lift The World

NEW PRODUCTS and equipment

Reply card on page 129 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Plating Barrel Conveyor

. . . for standard plating

This is a heavy-duty, high-production machine. The chassis is rigidly constructed.

Timer-controlled speed and power-operated skip transfers make for flexibility. All cylinders (their rpm can be changed) are potentially capable of individual lowering or raising. Machine is engineered so the operating mechanism is over tanks, except the vee-belt, which will not rust. Separate chains are used for the conveyor and for elevating. Machine is electrically and mechanically operated. The power-operated hopper, with weighing scale, is used for loading machine. Udylite Corp.

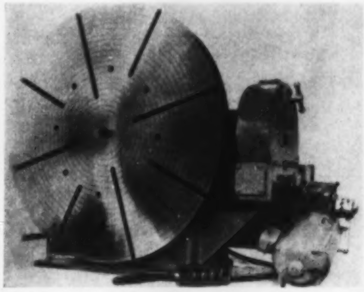
FOR MORE DATA CIRCLE REPLY CARD NO. 1

Positioning Table

. . . power for tilting

Adaptation of its universal Rotab positioning table by Michigan Products Corp. provides power tilting as well as power for rotation. The company used Cone Drive shaft-mounted speed reducers on the end of the tilting shaft.

A 2-in. center distance unit is used on the 36-in. table; a 2½-in. unit on the 48-in. table. A ¾-hp motor at 1750 rpm drives the smaller unit, a 1½-hp motor at 1750 rpm moves the larger. It takes 15 seconds to move the table from horizontal to vertical plane or return. A clutch between the speed reducer hollow gear shaft and the table tilt mechanism permits disengagement of the shaft-mounted reducer for final adjustment of tilt angle to be made by handwheel. Cone Drive Gears Division, Michigan Tool Co.

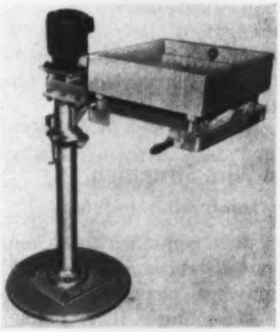


FOR MORE DATA CIRCLE REPLY CARD NO. 2

Riddle

. . . operation automatic

The Swing Riddle has been introduced by the Beardsley & Piper Division for use with all types of molding machines. It is mounted on a rugged steel base, and in operation it is positioned alongside a molding machine.



The riddle unit is automatic. Pivot mechanism is mounted on roller bearings. Riddling screens are available to meet any requirements. To riddle, machine operator swings riddle into position over pattern. Limit switch starts action and ends it when riddle is swung away from pattern. Pettibone Mulliken Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 3

Welding Electrode

. . . inert-gas, shielded arc

Developed for maximum weld quality of aluminum, this consumable electrode does not call for new equipment. It meets Navy specs.

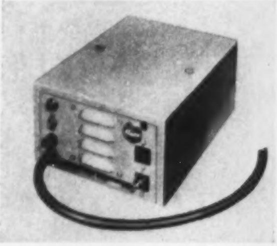
It is being produced from three aluminum alloys—2S, 43S and A45S, and is packaged and stocked on nonreturnable fiber spools in several wire sizes: 0.030, 0.040, 3/64, 1/16, 3/32 and ⅛ in. diameters. Diameter tolerances are plus 0.001 to minus 0.002 in. Each spool of I.G. Electrode contains 10 lb of wire level wound in one continuous length. Aluminum Co. of America.

FOR MORE DATA CIRCLE REPLY CARD NO. 4

Carrierphone

. . . for materials handling

The phones provide two-way communication between operators of mobile vehicles and a central dispatcher. Any number of mobile stations may be installed and integrated in a single system. Each



station consists of a transreceiver unit with an integral speaker and a press-to-talk, release-to-listen, hand microphone. Two-way FM carrier current is employed.

No Federal Communication Commission licenses are required to operate these phones. All maintenance can be performed by nonlicensed repairmen. Femco Inc.

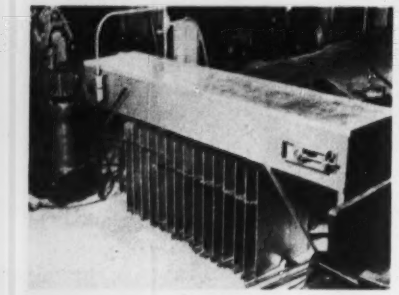
FOR MORE DATA CIRCLE REPLY CARD NO. 5

Core Rod Straightener

. . . sorts to length

This automatic machine eliminates much of the constant cost of replacing core rods. Most rods may be re-used.

An upper die drops on the rod at about 300 strokes a minute, straightening the rod against the lower serrated member and ejecting it to rollers. A conveyor carries them to the proper bin, where they are stored automatically. Hydro-Blast Corp.

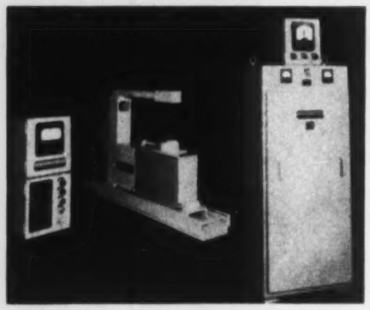


FOR MORE DATA CIRCLE REPLY CARD NO. 6

Thickness Control

. . . set to desired thickness

With sizing control designed to operate in conjunction with Sheffield Measuray and X-ray thickness gage, the operator simply sets dials on Measuray control cabinet to required thickness.



A feature of the control is the automatic regulation of screwdowns on the mill. When strip thickness varies from that set by operator, screwdowns on mill will either raise or lower depending on whether strip is too thin or too thick. A part of the system includes controls that anticipate whether the screwdowns need adjusting. Sheffield Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 7

Platform Truck

. . . 10,000 lb capacity

This vehicle is engineered as a standard Model EP-10 except it is equipped with a special slow-speed lifting jack that cushions the shock of raising and lowering.

The possibility of breaking or cracking fragile loads during lifting has been a problem when handling cores for foundries, cement blocks, rubber products, etc. Elwell-Parker Electric Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 8

Slitting, Edging Machine

. . . multiple, simultaneous

It processes low carbon, stainless and coated steels, aluminum, brass, copper and other materials in mill tonnages or warehouse quantities. Product meets standard specifications.

Savings can be reached by slitting and edging across the width of sheet in varied or similar widths. Caine Steel Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 9

Oval Wire Strapping

. . . reinforcing medium

Product combines the economics of round steel strapping wire with the physical characteristics of flat steel strapping. It is made in a wide range of sizes, and machines to apply it are available from stock.

The increased width of the oval wire is advantageous in many applications. This is particularly true where there is a possibility that round wire will cause an indentation when it is tensioned over nontest cartons or similar type packages. Renois Tying Machines Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 10

Horizontal Disc Grinder

. . . for single flat surface

Intended for quick freehand grinding of these surfaces on many small parts, the vertical spindle carries an 18-in. diameter grinding wheel. It is mounted in antifriction bearings.

The unit is driven through multiple V-belts from a 5 hp motor mounted on a hinged plate for easy belt adjustment. A guard encloses the motor and drive. An outlet for attaching the dust collecting system is built into the base. A hand-operated bar type dresser is provided. The 1100-lb machine is crated for domestic shipment. Gardner Machine Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 11

Silicone Resin

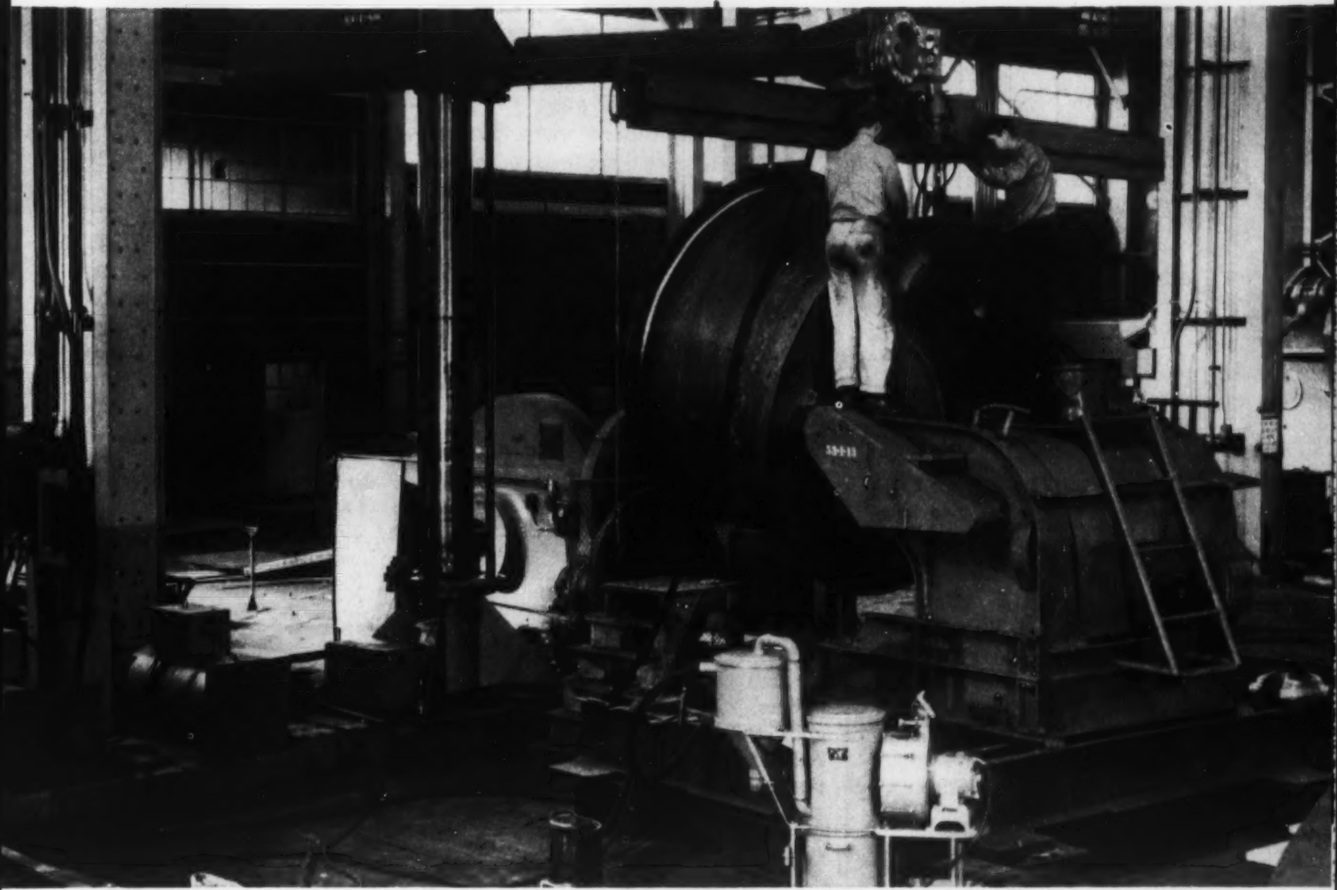
. . . heat resistant

It also has an excellent balance of cure speed, flexibility and hardness. Designated SR-111, the resin for the paint industry is designed for use alone, or modified with organic resins in formulating heat and weather-resistant protective coatings.

Tested by the Silicone Products Dept., it shows no color change and retains most of its initial gloss for more than 10 weeks at temperatures up to 500° F on steel and aluminum. Its compatibility

CONTINENTAL

PLATE, STRUCTURAL AND COMPOSITE WELDMENTS



AUTOMATIC WELDING MAKES A VALUABLE DIFFERENCE

Modern methods like automatic welding produce part of the extra value built into Continental weldments. The automatic welding head manipulator shown above was especially designed by Continental to give standard automatic welding still greater versatility. It lays precise amounts of weld metal per foot with definite, uniform penetration. It offers far wider travel both horizontally and vertically—does more jobs per set-up at lower cost.

Heavy duty welding manipulators also serve to put work pieces in the most favorable position for best welding techniques. Methods like these make the *valuable difference* in Continental Weldments.

NEW!

WRITE

for Brochure S on Continental Weldments.

COMPLETE ROLLING MILLS • ROLLS
STEEL CASTINGS • WELDMENTS
BOILER CONTROLS AND CLEANING

Plants at
East Chicago, Ind. • Wheeling, W. Va. • Pittsburgh, Pa.
***Copes-Vulcan Division:* Erie, Pa.**

CHICAGO • PITTSBURGH

CONTINENTAL
Foundry & Machine
Company

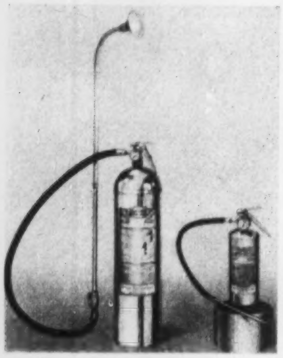
makes it suitable for use in colored and aluminum finishes. General Electric Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 12

Fire Extinguisher

. . for magnesium chips

These fires can be extinguished with a liquid that is nontoxic, noncorrosive, nonabrasive, nonconductive. It will not freeze and it does not produce excessive smoke or irritating fumes.



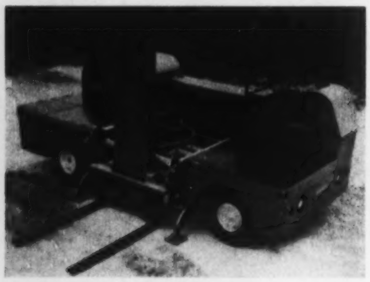
The M-X extinguisher is available in 2 quart and 2½ gallon sizes. Pressurized at 175 and 200 lb, respectively, with air or nitrogen, the units will extinguish incipient magnesium fires in seconds. Buffalo Fire Appliance Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 13

Fork Truck

. . . side loading

The Traveloader model has been improved to provide better stability, higher tractive effort and better load distribution. The T-10-A includes a torque converter drive and springing of all four wheels.



Although the machine has been made wider, turning radius is less, providing better aisle spacing and a larger sq ft storage volume. Baker-Raulang Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 14

FREE LITERATURE

Catalogs and Clip Sheets

Reply card on page 129 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue.

Cast Steel Machinability

Steel Founders Society of America—Machinabilty of cast steels—based on work done by Metcut Research Associates—is reported.

FOR A FREE COPY CIRCLE REPLY CARD NO. 15

Speed Reducers

Michigan Tool Co.—Cone-Drive Gears Division offers Bulletin CD-323 which details shaft mounted speed reducers. The 8-page bulletin shows how standard Cone-Drive shaft mounted reducers can be motorized by the use of bell housing adapters that accommodate standard NEMA C-type flanged motors from 1 to 5 hp. Engineering details to help select the right reducer for a particular application are given.

FOR A FREE COPY CIRCLE REPLY CARD NO. 16

Projection Welders

Sciaky Bros. Inc.—A new design of standard EP1 and SP1 spot welders are described in a 6-page brochure. They are air-operated, press type, low impedance single phase spot and projection welders. Design features covered.

FOR A FREE COPY CIRCLE REPLY CARD NO. 17

Eelctric Motors

U. S. Electrical Motors Inc.—This company offers a multi-color booklet illustrating the 20 principal types of improved U. S. motors. The following types are among those included: Uniclosed; Totally-Enclosed; Explosion-Proof with and without fan. Cut-open views of some of the motors are included.

FOR A FREE COPY CIRCLE REPLY CARD NO. 18

Valves

Ledeen Mfg. Co.—This 16-page booklet covers their line of standard 4-way hand, foot, power and solenoid operated valves. It also shows a new line of pilot valves. Dimensions and weights, application diagrams, circuit diagrams, parts lists and accessories are included.

FOR A FREE COPY CIRCLE REPLY CARD NO. 19

Vacuum Metallizing

F. J. Stokes Machine Co.—The depositing of thin coatings of metal by evaporation and condensation under high vacuum conditions is fully described in "Vacuum Metallizing." The brochure itself is a specimen of the silver-bright finish obtained by this process. Its cover is a sheet of acetate which has been vacuum metallized with a coating of aluminum 3 millionths of an in. thick before being bonded to the paper stock. Specifications for the complete range of Stokes vacuum metallizing equipment are included.

FOR A FREE COPY CIRCLE REPLY CARD NO. 20

Polyester Film

E. I. du Pont de Nemours & Co. Inc.—Two new technical reports concern Mylar polyester film . . . one covers the film's physical, chemical and electrical properties, the other on adhesives developed for bonding it to other materials.

FOR A FREE COPY CIRCLE REPLY CARD NO. 21

Oscillograph

Consolidated Engineering Corp.—CEC Instruments Inc., subsidiary, offers Bulletin CEC-1521A covering their low-cost compact recording oscillograph. Complete data includes photos and specifications.

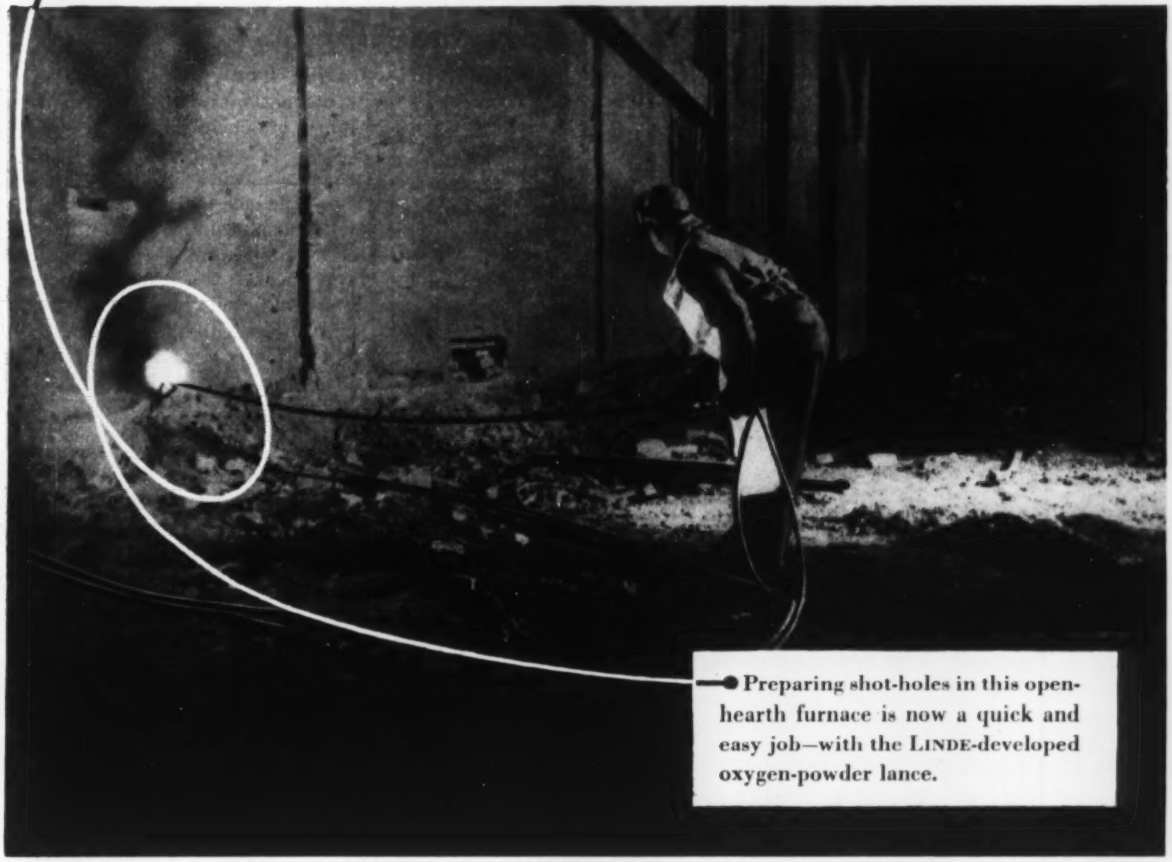
FOR A FREE COPY CIRCLE REPLY CARD NO. 22

Thermo-Plastic Pipe

Frederic B. Stevens Inc.—Two bulletins, "Uscolite Pipe and Fittings" and "Uscolite Diaphragm Valve" are available. Characteris-

How Oxygen . . . and LINDE SERVICE*

BLASTED A BOTTLENECK IN MAKING SHOT-HOLES



Preparing shot-holes in this open-hearth furnace is now a quick and easy job—with the Linde-developed oxygen-powder lance.

When rebuilding open-hearth furnaces, the brickwork and cinder must be blasted out. In the past, this meant using hand or wagon drills to make shot-holes for the charge, a slow and costly process. Built-in shot-holes were tried, but they were expensive to build and often became clogged with slag.

Linde Service set out to lick this problem. Linde engineers, working with mill people, recommended a Linde-developed oxygen-powder lance. Not only did the lance prepare shot-holes in record time, it also provided a quick and easy way to remove 'hard-spots'—sections of the lining that refused to crumble when blasted.

Today, the oxygen powder lance is proving itself to be a vital aid in rebuilding open-hearth furnaces.

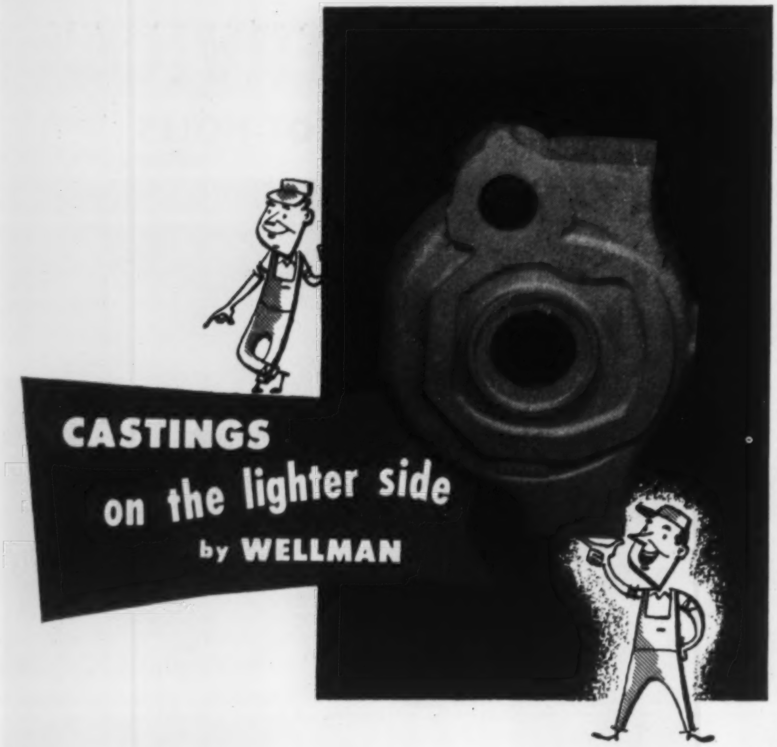
*LINDE SERVICE

is the unique combination of research, engineering, and more than 40 years of accumulated know-how that is helping Linde customers save money and improve production in their uses of oxygen and oxy-acetylene processes.

If your company uses oxygen, Linde Service can mean dollar savings to you. Let us tell you more about it.

LINDE AIR PRODUCTS COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
Offices in Principal Cities
In Canada: Dominion Oxygen Company
Division of Union Carbide Canada Limited

Linde
Trade-Mark



To be sure you're getting top quality lightweight castings, you'll want to look for:

- An experienced manufacturer
- A product made under close laboratory control and inspection
- Competent designers to work with your engineers
- A wide range of specifications and alloys
- Production economy

And you won't have to look far . . . just get in touch with WELLMAN. We'll be happy to help you with your castings problem.

Catalog No. 53 on request.

Well-Cast MAGNESIUM, ALUMINUM AND BRONZE CASTINGS
Well-Made WOOD AND METAL PATTERNS

THE WELLMAN BRONZE & ALUMINUM CO.
Dept. 19, 12800 Shaker Boulevard Cleveland 20, Ohio

tics are listed. Booklets are amply illustrated. Stevens Inc. has been appointed national distributor in the U. S. and Canada to the metal finishing industry for this piping, fitting and valves manufactured by U. S. Rubber Co.

FOR A FREE COPY CIRCLE REPLY CARD NO. 23

Ductile Iron

International Nickel Co. Inc.—Effect of chemistry and section size on properties of ductile iron are explained in Bulletin DI-16. The influence of carbon, silicon and phosphorus contents and of section size on the mechanical properties of the iron. 12 pages, 24 charts and photomicrographs are contained in the bulletin.

FOR A FREE COPY CIRCLE REPLY CARD NO. 24

Handle Handbook

E. H. Titchener & Co.—A 20-page handle handbook has full-size illustrations of 73 styles and types of standard handles and clips. Purpose: To show a great number of standard handles and give basic information, plus suggestions, concerning the design or purchase of special handles.

FOR A FREE COPY CIRCLE REPLY CARD NO. 25

Die Casting

National Die Casting Co.—A 6-page brochure describes die casting facilities. Die casting machines and machining facilities are described and pictured. A composition data sheet (on zinc and aluminum alloys for die casting) is included.

FOR A FREE COPY CIRCLE REPLY CARD NO. 26

Joints

Curtis Universal Joint Co. Inc.—This catalog is written for design engineers and purchasing men. It contains data on testing equipment, keyways, broaches and universal joints. Discount schedule, dimension drawings, conversion tables and photos included.

FOR A FREE COPY CIRCLE REPLY CARD NO. 27

Tool-Steel

Uddeholm Co. of America Inc.—A comparison chart, recently published, shows general classification; SAE, AISI and JIC no. for 15 different types of tool and die steels as well as brand names used by 12 leading mills. The 4-page chart is punched for use in 3-ring binder.

FOR A FREE COPY CIRCLE REPLY CARD NO. 28

USE A CARD

FREE CATALOGS and LITERATURE

NEW PRODUCT INFORMATION

INFORMATION ON ADVERTISED PRODUCTS

FREE EDITORIAL CLIP SHEETS

Engine Cooling Systems

Cummins Engine Co. Inc.—The Service Division offers "Give the Cooling System A Chance." It points out that it pays to keep the system in good condition because neglect will result in expensive repair bills or loss of an engine. Many practical suggestions on the best way to care for an engine's cooling system are given.

FOR A FREE COPY CIRCLE REPLY CARD NO. 29

Metallizing

Metallizing Engineering Co. Inc.—The current issue of the *Metco News* describes and illustrates a large number of money saving metallizing applications. The experience of a petroleum company with its gasification tubes and the restoration of the press fit and slip fit on end bells of Diesel generators are case histories given. Other applications are illustrated.

FOR A FREE COPY CIRCLE REPLY CARD NO 30

Controlled Volume Pumps

Milton Roy Co.—Bulletin 1253 describes and illustrates how Controlled Volume Pumps can be used as flow controllers, ration controllers and final control elements in process instrumentation. The various types available, how they operate, engineering data on and flow diagrams describing typical applications are included.

FOR A FREE COPY CIRCLE REPLY CARD NO. 31

Crane Shovel

Bay City Shovels Inc.—A 16-page illustrated catalog describes the design and construction features of their $1\frac{1}{2}$-yd Crane-Shovel. Machinery and parts pictures showing many of the designs and improvements supplement the text.

FOR A FREE COPY CIRCLE REPLY CARD NO. 32

Cast Stainless Alloys

Alloy Casting Institute—A set of data sheets offered covers the properties of all the more popular grades of alloys used for corrosion resistant (stainless steel) castings. Thirteen data sheets describe each of the cast corrosion-resistant alloy grades. The complete set, bound in a file folder, is available.

FOR A FREE COPY CIRCLE REPLY CARD NO. 33

Ceramics

Illinois Institute of Technology—The public relations department of Armour Research Foundation issues a brochure explaining the solution ceramics process. The brochure is intended for industrial firms which might be interested in a process that will produce ceramic coatings which are not brittle and are easily applied. Question and answer technique is used.

FOR A FREE COPY CIRCLE REPLY CARD NO. 34

Gage Selector

Threadwell Tap & Die Co.—The Gage Selector offered is intended as a desk or tool box mate to their Tap Selector. It can be used for both ring and plug gages in fractional or numbered sizes. It also gives a short, concise definition of the classes and specifications.

FOR A FREE COPY CIRCLE REPLY CARD NO. 35

Cylinder Manifolds

National Welding Equipment Co.—Pages of their "National Notes" detail and illustrate their compound pressure cylinder manifold design.

FOR A FREE COPY CIRCLE REPLY CARD NO. 36

Valves

Crane Co.—"Choosing the Right Valve" is intended to serve as a refresher in the application of basic valve designs for specifiers and buyers of piping equipment. It puts at the piping engineer's el-

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7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
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bow a great variety of valve types, each with some special qualification for service. From these he may choose the right one to provide dependable and economical performance in each specific instance.

FOR A FREE COPY CIRCLE REPLY CARD NO. 37

Electronic Counters

Potter Instrument Co. Inc.—A 20-page booklet contains detailed descriptions of equipment and techniques for controlling industrial equipment with counters. Over a dozen typical applications are explained and illustrated in detailed diagrams.

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Pneumatic Handling

Fuller Co.—"How to Pull Dollars Out of Thin Air" tells in 16 pages how handling costs can be reduced by using the proper pneumatic handling system. Fuller rotary compressors, the clinker cooler and their kiln preheater are covered. A list of materials handled is given. The booklet is illustrated.

FOR A FREE COPY CIRCLE REPLY CARD NO. 39

Roofing Accessories

Aluminum Co. of America—Four newly-designed aluminum roofing accessories are available to protect the joint between the roof and wall of a building. Various types of copings and gravel stops are described in a 17-page brochure. Specifications and installation data are given on each type described.

FOR A FREE COPY CIRCLE REPLY CARD NO. 40

Gas Turbines

General Electric Co.—A new publication explains the application of gas turbines for gas pipeline pumping. The 12-page booklet, GEA-5962, contains detailed information on the operation and application of gas turbines for gas pipelines. Numerous illustrations and drawings help explain turbine uses.

FOR A FREE COPY CIRCLE REPLY CARD NO. 41

Engineering Manual

Thomas Associates—No. 201G manual is intended to bring you complete design data on the many types of clamps and related items they manufacture. The detailed listing is supplemented with illustrations of each type covered.

FOR A FREE COPY CIRCLE REPLY CARD NO. 42

Telephone Systems

Automatic Electric Sales Corp.—The story of how a brewery makes use of a private internal telephone system to control quality and integrate complex operations is an 8-page case history.

FOR A FREE COPY CIRCLE REPLY CARD NO. 43

Knife Grinders

Hanchett Mfg. Co.—Full descriptive data dealing with knife, shear blade and circular knife grinders are available. Information on various types of machines designed for paper knife and doctor blade fixturing is included.

FOR A FREE COPY CIRCLE REPLY CARD NO. 44

EDITORIAL REPRINTS

Auto Parts Suppliers

Automakers are taking a long look at their costs. They're asking their suppliers to do the same—and to build for the future. Automation is one answer. It's the step Watts Electric Co. took, see p. 65.

FOR A FREE COPY CIRCLE REPLY CARD NO. 45

Fabricating Titanium

Engineers at Ryan Aeronautical Co. made a study of processes involved in sheet metal fabrication of commercial titanium. Here's a run-down, p. 94, on what they found. It will help you do a better job with the metal.

FOR A FREE COPY CIRCLE REPLY CARD NO. 46

Hydrogen and Welding

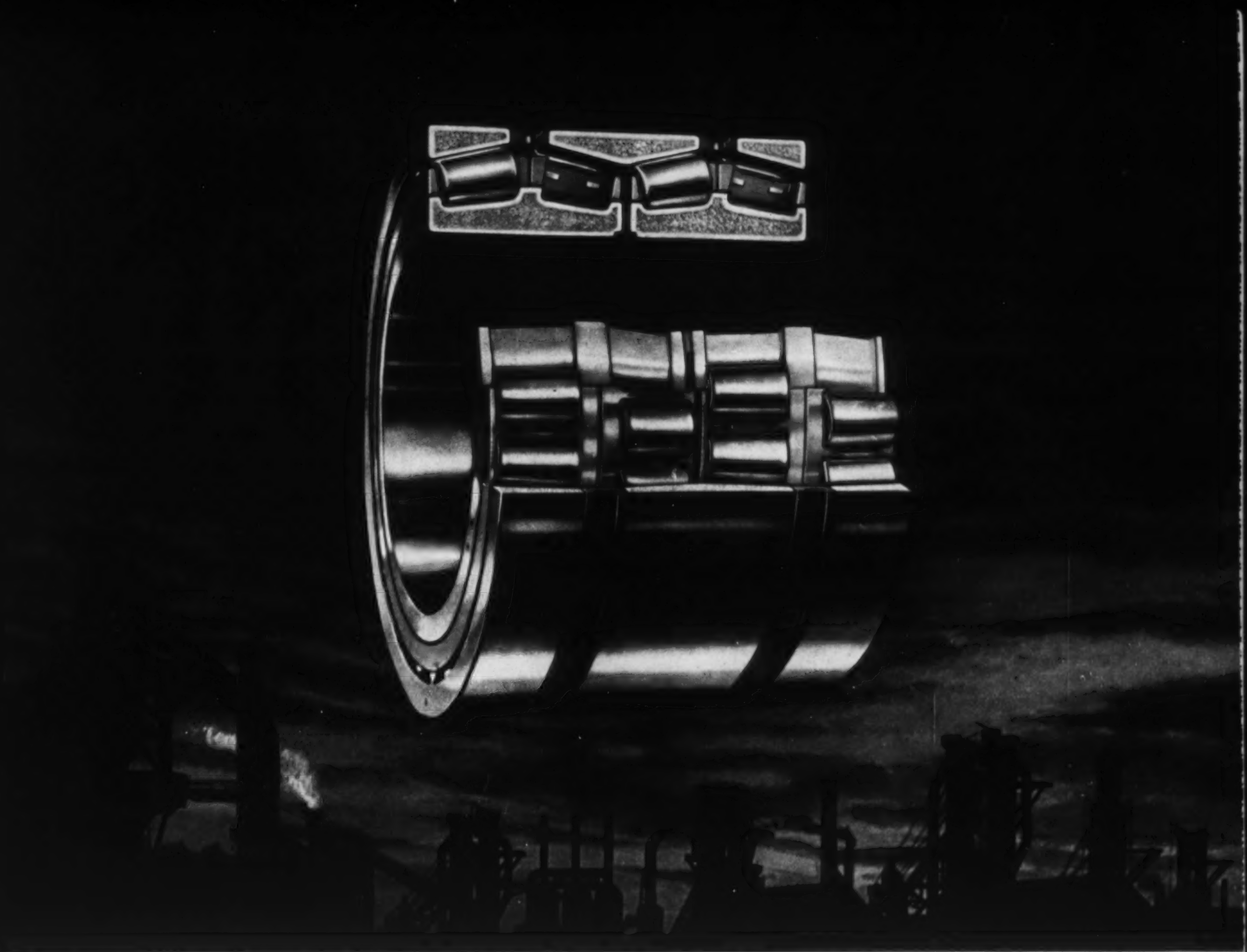
Part I discussed how and where hydrogen works against the welder. The concluding article, beginning on p. 108, goes into the methods developed to combat the trouble.

FOR A FREE COPY CIRCLE REPLY CARD NO 47

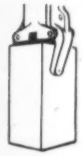
Steel Casting Standards

SFSA has recommended minimum standards for commercial carbon steel castings. It's designed to promote user-supplier understanding. You'll find a discussion of the requirements on p. 112.

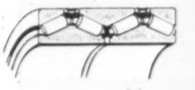
FOR A FREE COPY CIRCLE REPLY CARD NO. 48



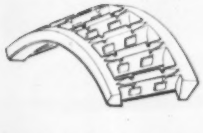
Here's why TORRINGTON work roll bearings establish rolling mill records



Highest quality electric furnace alloy steels are used—carburized and heat treated to provide toughness, hardness, stability and uniformity.



Torrington Work Roll Bearings are designed and built with high thrust capacity to give better service under actual operating conditions.



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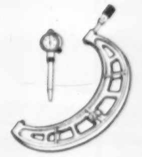

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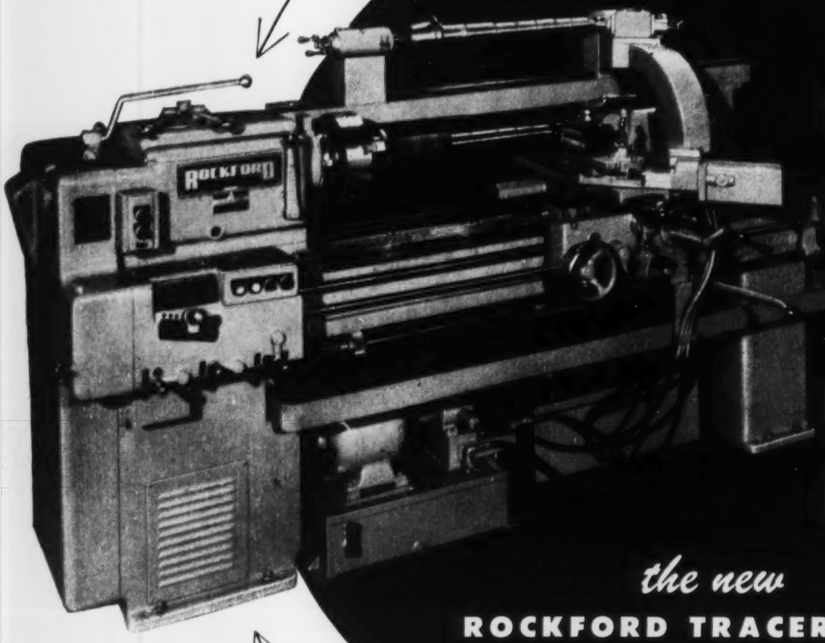

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2500 KISHWAUKEE STREET, ROCKFORD, ILLINOIS

STEEL

October 4, 1954

Market Outlook

THE EXPECTED autumn upturn in the steel business is here.

For the third consecutive week, steel ingot production increased. A 2-point rise in the week ended Oct. 3 put the ingot rate up to 68.5 per cent of capacity—highest since June. In the last three weeks ingot production has risen 5 points.

GETTING READY— All this increase does not come from new orders already booked. It comes partly from preparations of the steel industry to meet orders that are expected to come out in the next few weeks. To be ready, mills are building up stocks of semifinished steel, particularly slabs that will be transformed into hot-rolled and cold-rolled sheet for the automobile industry, where bulk of the rise in steel demand is expected to come from. Its big needs are light flat-rolled steel. So, mills are stocking up slabs from which sheets are rolled.

WATCH FOR SQUEEZE— If automotive demand for steel resumes to the extent expected, steel deliveries may not be quite as prompt as they are now. By late November and early December there might be a steel supply squeeze. That's when inventories should be reduced enough to put buyers back into the market for steel, at least for current consumption rates. Since June, 1953, consumers have been reducing their steel inventories. It appears that inventory reduction is about completed. If many buyers go into the market at the same time, it will take longer to get delivery. Consumers with low inventories may be caught with short supplies.

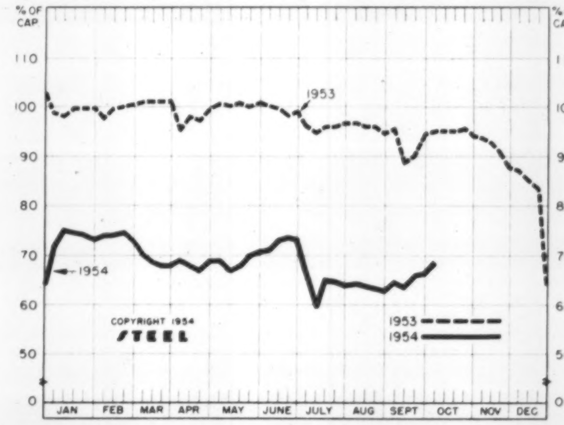
LIVING IT UP— Since June 1953, mill shipments of steel have been less than consumption (see p. 147). From July, 1953, to August, 1954, both inclusive, consumers reduced steel inventories 9.9 million net tons, a STEEL study shows. That is equal to about two months' shipments, at the rate of shipments this year. It's commonly estimated that consumers have lowered their steel inventories to a 30-day supply. Apparently, there was a three-month supply—15 million tons—of steel in users' stocks when inventory reduction started in July, 1953. Studies confirm that inventory building began in September, 1950.

AIMS— While most consumers seem to be aiming at a 30-day steel supply, there are reports that some are inclined to raise stocks to a 45-day level. But one of the Big Three automobile producers is banking on steel being readily available. It's holding to a 21-day inventory.

DELIVERIES LENGTHEN— Indicative of the increased demand for steel, deliveries of cold-rolled carbon steel sheets are becoming further extended. In the Chicago area they are approaching ten weeks, longest for any period this year. In early August they could be had in four weeks. Pittsburgh Steel Co. started round-the-clock operations for the first time at its new cold-rolled sheet mill at Allenport, Pa.

PRICE TRENDS— Export demand for scrap and prospects for increased steel production in the United States pushed STEEL's price composite on steelmaking scrap to $30.50 a gross ton, a new high for the year. STEEL's price composite on finished steel remains unchanged at $117.77 per net ton for the week ended Sept. 30, but it will rise next week because increased prices of tin plate became effective Oct. 1.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Oct. 3	Change	Same Week 1953	Same Week 1952
Pittsburgh	66.5	— 0.5*	100	104
Chicago	69.5	0*	98.5	107.5
Mid-Atlantic	58	0	97	98
Youngstown	57	+ 5.5	105	106
Wheeling	86.5	0	97.5	97.5
Cleveland	77.5	— 2.5*	93.5	105.5
Buffalo	66	+ 5	106.5	106
Birmingham	71	— 4	96.5	101
New England	48	— 1	82	87
Cincinnati	64	+ 2	85	90
St. Louis	69	0	96	108
Detroit	75	+ 5	101.5	108
Western	87	+ 6	103	102.5
National Rate ..	68.5	+ 2	95	103.5

INGOT PRODUCTION‡

	Week Ended Oct. 3	Week Ago	Month Ago	Year Ago
INDEX .... (1947-1949=100)	102.2†	101.9	94.9	133.8
NET TONS .... (In thousands)	1,642†	1,637	1,525	2,149

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,254,459 in 1953; 2,077,040 in 1952.

Metalworking Outlook—p. 43   *Technical Outlook—p. 93*

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Sept. 28 1954	Sept. 21 1954	Month Ago	Sept. Average
(1947-1949=100)	144.6	144.6	144.5	144.6

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Sept. 28

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1 ...	$4.525
Rails, light, 40 lb	5.917
Tie Plates	5.275
Axles, railway	7.500
Wheels, freight car, 33 in. (per wheel)	48.500
Plates, carbon	4.675
Structural Shapes	4.517
Bars, tool steel, carbon (lb)	0.430
Bars, tool steel, alloy, oil hardening die (lb)	0.525
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.115
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.610
Bars, H.R., alloy	8.783
Bars, H.R., stainless, 303 (lb)	0.418
Bars, H.R., carbon	5.023
Bars, reinforcing	5.058
Bars, C.F., carbon	8.174
Bars, C.F., alloy	11.285
Bars, C.F., stainless, 302 (lb)	0.433
Sheets, H.R., carbon	4.880
Sheets, C.R., carbon	5.871
Sheets, galvanized	7.220
Sheets, C.R., stainless, 302 (lb)	0.548
Sheets, electrical	9.350
Strip, C.R., carbon	$7.507
Strip, C.R., stainless, 430 (lb)	0.415
Strip, H.R., carbon	5.125
Pipe, black, buttweld (100 ft)	15.000
Pipe, galv., buttweld (100 ft)	18.605
Pipe, line (100 ft)	146.804
Casing, oil well, carbon (100 ft)	154.216
Casing, oil well, alloy (100 ft)	227.875
Tubes, boiler (100 ft) ...	‡
Tubing, mechanical, carbon	‡
Tubing, mechanical, stainless, 304 (100 ft)	161.193
Tin plate, hot-dipped, 1.25 lb	8.433
Tin plate, electrolytic, 0.25 lb	7.133
Black plate, can making quality	6.233
Wire, drawn, carbon	7.938
Wire, drawn, stainless, 430 (lb)	0.545
Bale ties (bundle)	5.860
Nails, wire, 8d common	7.815
Wire, barbed (80-rod spool)	7.109
Woven wire fence (20-rod roll)	16.815

‡Not available.

STEEL's FINISHED STEEL PRICE INDEX*

	Sept. 29 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100) ...	194.19	194.19	194.19	189.38	152.52
Index in cents per lb.......	5.261	5.261	5.261	5.130	4.132

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$117.77	$117.77	$117.77	$115.56	$91.55
No. 2 Fdry, Pig Iron, GT..	56.54	56.54	56.54	56.54	46.10
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.60
Malleable Pig Iron, GT ...	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	30.50	29.75	29.00	31.50	27.58

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Sept. 29 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.35
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.35
Bars, H.R., del. Philadelphia	4.55	4.55	4.55	5.302	3.83
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	3.95-4.00
Shapes, Std., Pittsburgh ...	4.25	4.25	4.25	4.10	3.25
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.25
Shapes, del., Philadelphia ..	4.53	4.53	4.53	4.38	3.50
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.40
Plates, Chicago	4.225	4.225	4.225	4.10	3.40
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.35	3.50
Plates, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.40
Plates, Claymont, Del.	4.225	4.225	4.225	4.55	3.50
Sheets, H.R., Pittsburgh ...	4.05	4.05	4.05	3.925	3.25
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Sheets, C.R., Pittsburgh ...	4.95	4.95	4.95	4.775	4.00
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.00
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.20
Sheets, Galv., Pittsburgh...	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pitts.	4.05	4.05	4.05	4.025	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45-5.95	4.00
Strip, C.R., Chicago	6.00	6.00	6.00	5.70	4.00-4.15
Strip, C.R., Detroit	5.60-.90	5.60-.90	5.60-.90	5.45-6.05	4.20-.25
Wire, Basic, Pitts.	5.75	5.75	5.75	5.475-5.525	4.15
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.35-6.55	5.15
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$7.75

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$78.00	$78.00	$78.00	$75.50	$61.00
Wire rods, $\frac{7}{32}$-⅝" Pitts....	4.675	4.675	4.675	4.525	3.40

PIG IRON, Gross Ton

Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	49.66	49.66	49.66	60.75	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, del. Phila.	50.16	50.16	50.16	61.25	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	39.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	60.43	45.43
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne.	190.00†	190.00†	200.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts...	$30.50	$30.50	$29.50	$34.50	$29.75
No. 1 Heavy Melt, E. Pa...	29.00	28.75	27.50	30.50	25.00
No. 1 Heavy Melt, Chicago.	32.00	30.00	30.00	29.50	28.00
No. 1 Heavy Melt, Valley..	32.50	32.50	30.50	34.50	31.25
No. 1 Heavy Melt, Cleve...	30.50	30.50	28.50	30.50	26.50
No. 1 Heavy Melt, Buffalo.	28.50	28.50	26.50	35.50	28.25
Rails, Rerolling, Chicago ..	51.50	47.50	44.50	49.00	41.50
No. 1 Cast, Chicago	38.50	35.50	35.50	32.50	41.50

COKE, Net Ton

Beehive, Furn, Connlsvl. ..	$14.75	$14.75	$14.75	$14.75	$13.25
Beehive, Fdry, Connlsvl. ..	16.75	16.75	16.75	16.75	15.75
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.00

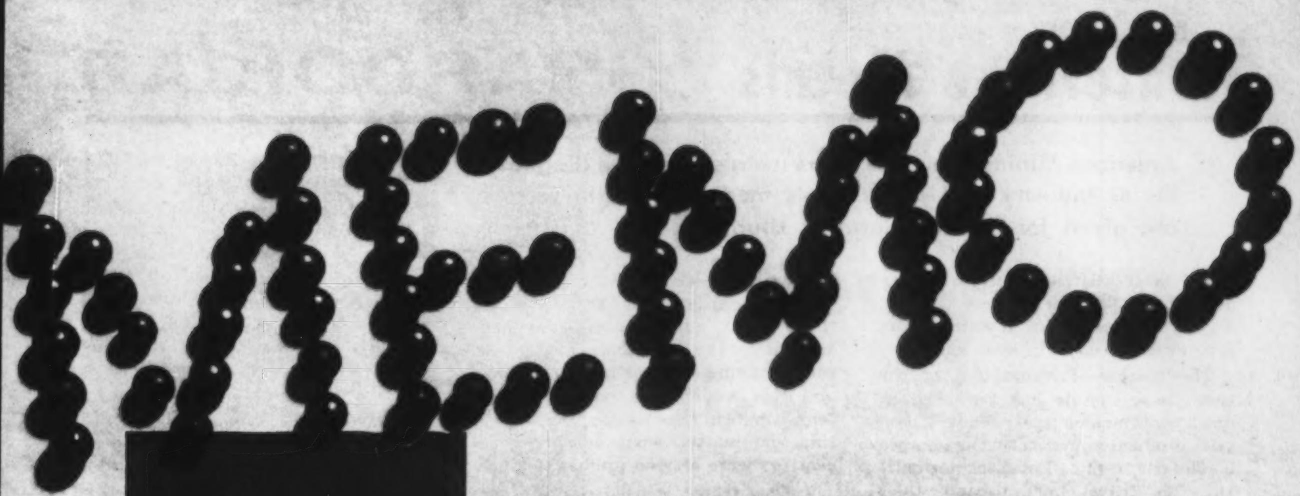
Daily Nonferrous Price Record

	Price Sept. 29	Last Change	Previous Price	Aug. Avg.	July Avg.	Sept. 1953 Avg.
Copper	30.00	Apr. 12	29.75–30.00	30.000	30.000	29.50
Lead	14.55	Sept. 15	14.30	13.846	13.800	13.540
Zinc	11.50	Sept. 3	11.00	11.000	11.000	10.180
Tin	93.50	Sept. 29	93.25	93.332	96.562	82.410
Nickel	60.00	Jan. 14, 1953	56.50	60.000	60.000	60.000
Aluminum ..	22.20	Aug. 5, 1954	21.50	22.119	21.500	21.500
Magnesium .	27.00	Mar. 9, 1953	24.50	27.000	27.000	27.000

Quotations in cents per pound based on; Copper, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99+ %, del.; Magnesium 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.**
  Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.**
  Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.**
  Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.**
  Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**



20th Century

the persuasive abrasive

Make a mental note to specify 20th Century *Normalized shot or grit for your abrasive requirements. It's manufactured under close laboratory control to assure consistent high quality, greater uniformity and longer wear.

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*One of the world's largest producers of quality shot, grit and powder — Hard Iron — Malleable (*Normalized) — Cut Wire — Cast Steel (Realsteel)*

** Copyrighted trade name*

Various parts for these Caterpillar-built D8 tractors are peened and cleaned by 20th Century metallic abrasives.

Nonferrous Metals

American Mining Congress hears metals executive diagnose ills of industry and prescribe its medicine. Eight factors are given for present alarming situation

HOW TO WIN friends and influence demand. That's a subject getting a growing measure of attention from producers of copper, lead and zinc.

The Reason—Consumption of the three base metals has remained at dead center since 1947, while industrial production generally has climbed 25-30 per cent. Because normally the two travel hand-in-hand, their divergence provides real cause for alarm.

Thought Provoking—How can these older nonferrous metals share in our continuing economic growth? Below are suggestions given the American Mining Congress meeting in San Francisco by Simon Strauss, vice president, American Smelting & Refining Co.

1. Producers must be prepared to offer their wares at an economic price in relation to competitive materials.

2. Fabricators and manufacturers who convert the metals into finished products must have reasonable assurance of future supplies.

3. The industry must stress development of its technology and concentrate on finding ways to make the use of copper, lead and zinc both easier and cheaper.

Needling the Protectionists—"Such assurance is not increased by overemphasis on the mining industry's economic problems nor by excessive reliance on government assistance—whether it be tariffs, stockpiling, subsidy schemes, import quotas or allocations," Mr. Strauss pointedly commented. The lead-zinc industries are currently being bailed out of economic distress by a mammoth stockpiling program.

Metals Equation—Eight factors have influenced the copper-lead-zinc equation in recent years, according to the metals executive.

1. One should not consider that the metals are falling by the wayside if their use does not increase quite as rapidly as over-all economic activity. Much of the new economic growth of the country is in such fields as electronics and aviation, which are enormous users of manhours but small users of raw materials.

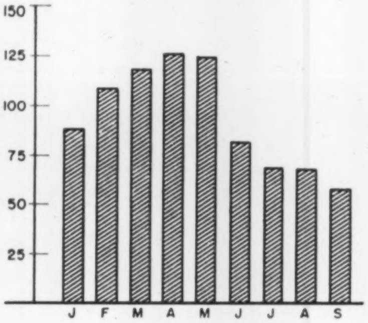
2. A factor that has hurt copper, lead and zinc has been the relatively inelastic capacity of these industries. U. S. aluminum capacity has doubled in the last three years. A corresponding increase in copper, lead and zinc would have been virtually impossible in the same period of time, no matter what economic incentives were offered producers.

3. This factor has led the military to design away from base metals and into aluminum or steel. "The intelligent and aggressive drive for markets made by the aluminum producers has been premised on the promise to consumers that ample aluminum will be available. Consumers are less certain of base metal supply. Copper has lost ground to aluminum in the fields of electrical conductors and hardware. Zinc is faced with aluminum competition in die casting and galvanized sheets. Lead is threatened with aluminum applications for cable coverings."

Shrinking:

Domestic Producers' Stocks of Refined Copper

(Thousands of net tons at start of month)



Source: Copper Institute.

4. Substitution of aluminum has been encouraged by its relative price stability, accounted for principally by the limited number of producers and the relatively low labor factor in its cost of production. Demand for base metals varies considerably, but supply tends to remain constant. The result is wide swings in price.

5. Over a long period, price has a most important bearing on the volume of consumption, after consumers are convinced that it is going to stay high or stay low.

6. To say that low prices are caused by dumping here of metal produced abroad is an oversimplification of a complex problem. A tariff wall might protect the domestic miner from foreign competitors but not from substitute materials.

7. Accelerated stockpile buying (roughly two-thirds of current mine production rate is authorized) may be a solution to the industry's economic problems for the short term. Unless the government is to go on buying for stockpile forever, the industry must have more consumer demand to remain healthy.

8. As government stockpiles of base metals grow, incentive to design away from them for military purposes should lessen. In case of another emergency, the government will be less prone to finance expansion of aluminum capacity simply because it can be done more easily and more quickly. "The base metals have no quarrel with the growth of the aluminum industry if it is based on normal economic and technical development. But to have a competitive material financed on excessive scale by government funds for wartime purposes can create serious peacetime problems."

Market Memos

- Another kick upward is in store for lead unless the London price subsides. It should come before GSA starts buying this week for stockpile.

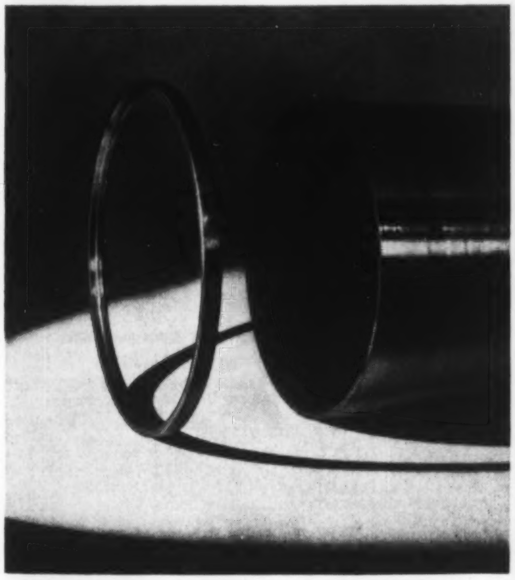
- Government release of stockpile copper for metals-starved fabricators in the fourth quarter is assured once labor problems are squared away.

- Price cutting on brass and bronze ingots is again rampant, even with higher scrap buying prices. Sales at 2 cents under published prices are reportedly being made by traders and shoestring operators.

- Chilean copper for January delivery is quoted at 31.25 cents per pound, New York. Domestic mine output still holds at 30 cents.

- Remelt aluminum ingot prices moved up a quarter-cent last week, but the secondary smelters are finding competition with primary producers increasingly tough.

RADIOGRAPHY reveals...



This stainless steel ring must be brazed to the cylinder. The bond between them must be sound—for the ring must hold the cylinder in place despite high stresses.

a better way to yield a better job!

THIS IS where radiography has done a double job. First, x-rays probed the structure of the bond, showed when it met requirements or when lack of fusion meant the part must be rejected.

Then, radiography went further. It helped reveal a new technic for brazing these two parts—a technic which yielded sound joints almost every time.

So, add another instance where radiography is more than paying its way. By doing such jobs as this, by testing pipeline joints, by proving soundness of the welds in pressure vessels, it is opening up new fields to welders.

Radiography can help you build business as well as earn a reputation for good work. Would you like to discuss how? Talk it over with your x-ray dealer.

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Rochester 4, N.Y.

Radiography...

another important example of Photography at Work.

Kodak

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 22.20, pigs 20.50 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 24; No. 43, 5% Si, 23.8; No. 142, 4% Cu, 25.1; No. 195, 4.5% Cu, 0.8% Si, 24.5; No. 214, 3.8% Mg, 25.2; No. 356, 7% Si, 0.3% Mg, 23.9.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.; Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb del.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg; $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 30.00 del. Conn. Valley, 30.00 del. Midwest; Lake 30.00 del; Fire refined 29.75 del.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $145-$150 per troy oz.

Lead: Common 14.55, chemical 14.65, corroding 14.65, St. Louis; N. Y. basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8%, self-palletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks, 1.3 in. diameter, 46.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New York, $320-$325, nom., per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or ingots for addition to cast iron, 60.00; prices f.o.b. Port Colborne, Ont., including import duty, New York basis, add 0.92.

Osmium: $140-$150 per troy oz nom.

Palladium: $21 per troy oz.

Platinum: $84-$87 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $75-$80 per troy oz.

Selenium: 99.5%, $5-$6 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 93.50.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max) $4.72; grade A-2 (0.5% Fe max) $4.46 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $4.95 per lb, f.o.b. shipping point; less than 1000 lb $5.10 99+% hydrogen reduced, $4.65. Treated ingots $6.70.

Zinc: Prime Western 11.50, brass special 11.75, intermediate 12.00, E. St. Louis, freight allowed over 0.50 per pound. High grade 12.85, special high grade 13.00, die casting alloy ingot 15.50, del.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloy 20.75-21.25; No. 12 foundry alloy (No. 2 grade) 19.75-20.25; 5% silicon alloy, 0.60 Cu max., 23.25-23.50; 13 alloy, 0.60 Cu max., 23.25-23.50; 195 alloy 21.25-22.25; 108 alloy 20.25-20.75; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 21.00-21.50; grade 2, 20.00-20.50; grade 3, 19.00-19.50; grade 4, 18.00-18.50.

Brass Ingot: Red brass, No. 115, 28.50; tin bronze No. 225, 40.00; No. 245, 33.75; high-leaded tin bronze, No. 305, 33.00; No. 1 yellow, No. 405, 24.25; manganese bronze No. 421, 26.75.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 27.00; AZ91C, 31.50; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.68; rod, bar, wire, $1.65.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb, 36.53; l.c.l. 37.03. Magnet wire del., 15,000 lb or more 41.83; l.c.l. 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $19.75 per cwt; pipe, full coils $19.75 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $11; forging billets $6; hot-rolled and forged bars, $6.

ZINC

(Prices per lb c.l., f.o.b. mill) Sheets 23.00, ribbon zinc in coils, 18.50-20.50; plates 18.00-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C.R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1 cent per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	86.5	67.5	92.5
Strip, C.R.	92.5	70.5	98.5
Plate, H.R.	84.5	66.5	90.5
Rod, Shapes ...	82.5	65.5	88.5
Seamless Tubes.	115.5	100.5	137.5
Shot, Blocks ...	...	60.0	...

ALUMINUM*

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	—Round— 2011-T3	2017-T4	—Hexagonal— 2011-T3	2017-T4
Drawn				
0.125	62.5	61.0	...	...
0.156-0.172	52.9	51.3	...	...
0.188	52.9	51.3	...	65.8
0.219-0.234	50.1	48.5	...	...
0.250-0.281	50.1	48.5	...	62.7
0.313	50.1	48.5	...	59.8
Cold-finished				
0.375-0.547	48.9	46.5	58.8	56.2
0.563-0.688	48.9	46.5	55.9	52.7
0.750-1.000	47.7	45.3	51.1	49.6
1.063	47.7	45.3	...	47.9
1.125-1.500	45.9	43.6	49.4	47.9
Rolled				
1.563	44.7	42.4	...	...
1.625-2.000	44.1	41.8	...	46.2
2.125-2.500	43.0	40.7	...	...
2.563-3.375	41.7	39.5	...	...

ALUMINUM*

Sheets and Circles: 1100 and 3003 mill finish c.l. (30,000 lb base; freight allowed over 499 lb)

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-49	34.9	...	...
0.135-0.096	12-48	35.4	...	...
0.095-0.077	12-48	36.1	33.6	38.6
0.076-0.061	12-48	36.7	33.8	38.8
0.060-0.048	12-48	37.2	34.1	39.2
0.047-0.038	12-48	37.7	34.6	39.6
0.037-0.030	12-48	38.1	35.0	40.3
0.029-0.024	12-48	38.7	35.3	40.8
0.023-0.019	12-36	39.4	36.1	41.6
0.018-0.017	12-36	40.2	36.7	42.5
0.016-0.015	12-36	41.1	37.5	43.7
0.014	12-24	42.1	38.5	45.0
0.013-0.012	12-24	43.3	39.2	46.0
0.011	12-24	44.3	40.4	47.6
0.010-0.0095	12-24	45.5	41.5	49.2
0.009-0.0085	12-24	46.8	43.0	51.3
0.008-0.0075	12-24	48.4	44.2	53.1
0.007	12-18	49.9	45.7	55.4
0.006	12-18	51.5	47.1	60.4

*72-180 in. lengths. †26 in. max. dia.

ALUMINUM*

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. width or dia, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.7	38.9
5050-F	34.7	38.9
3004-F	35.7	40.6
5052-F	37.4	42.4
6061-T6	38.6	43.0
2024-T4*	40.8	46.9
7075-T6*	48.6	55.2

*24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM*

Forging Stock: Round, Class 1, 46.8-36.3, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 52.6-40 in random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
¾	$15.70	2	$ 48.30
1	24.75	4	132.90
1¼	23.50	6	238.35
1½	40.05	8	358.60

*Alloy designations are standard for use on and after Oct. 1, 1954. To relate them to designations used prior to that time, see STEEL, Aug. 9, 1954, p. 95.

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot rolled AZ31, 53.00, 20,000 lb or more 0.250-in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in., 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clippings 14.00; low copper clippings 14.00; mixed clippings 12.00; old sheet 11.00; borings and turnings 7.00; pistons and struts 8.50; crankcases 11.00; industrial castings 11.00.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.98c	....	48.44	26.000	26.000	25.250
Yellow Brass	41.72	34.50d	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90% ...	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	59.43g	57.69	....	23.625	23.375	11.813
Phosphor Bronze, A, 5% ...	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Muntz Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: Heavy copper and wire, No. 1 25.50-26.00; No. 2 copper 24.00-24.50; light copper 22.00-22.50; No. 1 composition red brass 19.50; No. 1 composition turnings 19.00; mixed brass turnings 12.50; new brass clippings 18.00; No. 1 brass rod turnings 15.00; light brass 12.00; heavy yellow brass 15.00; new brass rod ends 16.00; auto radiators, unsweated 16.00; cocks and faucets 16.50; brass pipe 17.00.

Lead: Heavy 11.75-12.00; battery plate 6.25-6.50; linotype and stereotype 13.75-14.00; electrotype 12.00-12.50; mixed babbitt 12.50-13.00.

Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 16.50-17.50.

Monel: Clippings 23.00-25.00; old sheet 21.00-23.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 55.00-60.00; block tin pipe 75.00-80.00; No. 1 babbitt 50.00.

Zinc: Old zinc, 5.00-5.25; new die cast scrap, 4.75-5.00; old die cast scrap, 3.25-3.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 15.75-16.00; 51S, 52S clippings 15.75-16.00; 14S, 17S, 24S clippings 15.00-15.25; mixed clipping 14.50-14.75; old sheet 13.75-14.00; old cast 13.75-14.00; clean old cable, free of steel 15.75-16.00; borings and turnings 14.00-14.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 28.00; No. 2 copper 26.50; light copper 25.00; refinery brass (60% copper) per dry copper content 24.50-25.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 27.25; No. 2 copper 25.50; light copper 24.00; No. 1 composition borings 21.25; No. 1 composition solids 21.75-22.25; heavy yellow brass solids 17.50; yellow brass turnings 16.50; radiators 18.50.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.115; 200-499 lb $1.10; 500-999 lb $1.095; 1000 lb or more $1.09.

Zinc: Bar 18.50, bar or flat top 17.50 ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.

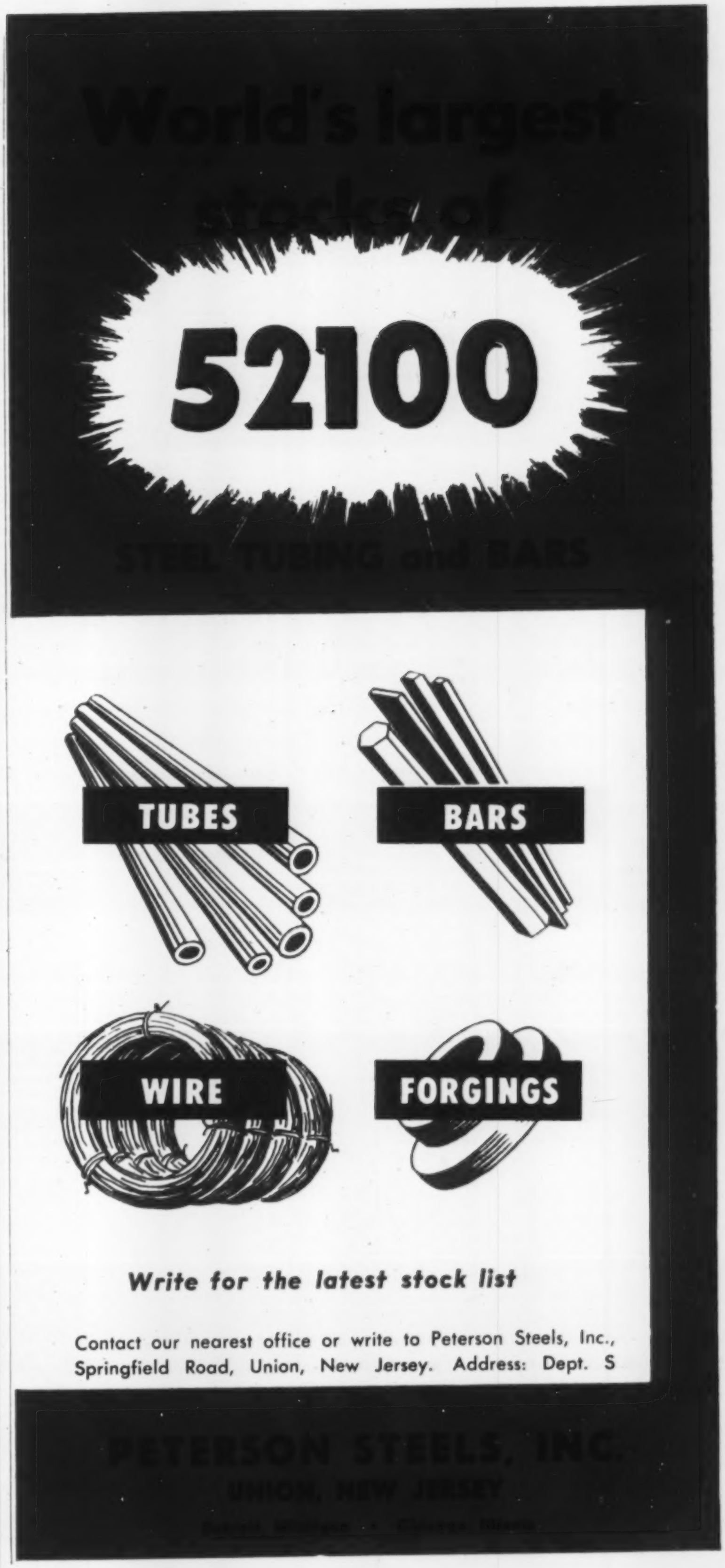
Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 71; 100-600 lb 56.7; 700-1900 lb 54.3; 2000-9900 lb 52.5; 10,000 lb or more 51.4.

Stannous Chloride: (Anhydrous): Less than 50 lb $1.57; 50 lb $1.23; 100-300 lb $1.08; 400-900 lb $1.055; 100-1900 lb $1.031; 2000-4900 lb 99.4; 5000-19,000 lb 99.3; 20,000 lb and over 87.2.

Stannous Sulphate: Less than 5 lb $1.269; 50 lb 96.9; 100-1900 lb 94.9; 2000 lb and over 92.9.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.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Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on page 141. Key to footnotes, page 143.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5	$61.50

INGOTS, Alloy (NT)

Detroit R7	$65.00
Houston S5	73.00
Midland,Pa. C18	65.00
Munhall,Pa. U5	65.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)

Aliquippa,Pa. J5	$64.00
Bessemer,Pa. U5	64.00
Buffalo R2	64.00
Clairton,Pa. U5	64.00
Ensley,Ala. T2	64.00
Fairfield,Ala. T2	64.00
Fontana,Calif. K1	72.00
Gary,Ind. U5	64.00
Johnstown,Pa. B2	64.00
Lackawanna,N.Y. B2	64.00
Munhall,Pa. U5	64.00
So.Chicago,Ill. R2,U5	64.00
So.Duquesne,Pa. U5	64.00
Youngstown R2	64.00

Carbon, Forging (NT)

Aliquippa,Pa. J5	$78.00
Bessemer,Pa. U5	78.00
Buffalo R2	78.00
Canton,O. R2	80.00
Clairton,Pa. U5	78.00
Conshohocken,Pa. A3	83.00
Ensley,Ala. T2	78.00
Fairfield,Ala. T2	78.00
Fontana,Calif. K1	86.00
Gary,Ind. U5	78.00
Geneva,Utah C11	78.00
Houston S5	85.00
Johnstown,Pa. B2	78.00
Lackawanna,N.Y. B2	78.00
LosAngeles B3	87.50
Munhall,Pa. U5	78.00
Seattle B3	91.50
So.Chicago R2,U5,W14	78.00
So.Duquesne,Pa. U5	78.00
So.SanFrancisco B3	87.50

Alloy, Forging (NT)

Bethlehem,Pa. B2	$86.00
Buffalo R2	86.00
Canton,O. R2, T7	86.00
Conshohocken,Pa. A3	93.00
Detroit R7	86.00
Fontana,Calif. K1	105.00
Gary,Ind. U5	86.00
Houston S5	93.00
Ind.Harbor,Ind. Y1	86.00
Johnstown,Pa. B2	86.00
Lackawanna,N.Y. B2	86.00
LosAngeles B3	106.00
Massillon,O. R2	86.00
Midland,Pa. C18	86.00
Munhall,Pa. U5	86.00
So.Chicago R2,U5,W14	86.00
So.Duquesne,Pa. U5	86.00
Struthers,O. Y1	86.00
Warren,O. C17	86.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2	$96.50
Canton,O. R2	96.50
Cleveland R2	96.50
Gary,Ind. U5	96.50
So.Chicago R2, W14	96.50
So.Duquesne,Pa. U5	96.50

SKELP

Aliquippa,Pa. J5	4.00
Fontana,Calif. K1	4.775
Munhall,Pa. U5	3.90
Warren,O. R2	3.90
Youngstown R2, U5	3.90

WIRE RODS

AlabamaCity,Ala. R2	4.675
Aliquippa,Pa. J5	4.675
Alton,Ill. L1	4.85
Buffalo B11, W12	4.675
Cleveland A7	4.675
Donora,Pa. A7	4.675
Fairfield,Ala. T2	4.675
Fontana,Calif. K1	5.475
Houston S5	5.075
IndianaHarbor,Ind. Y1	4.675
Johnstown,Pa. B2	4.675
Joliet,Ill. A7	4.675
KansasCity,Mo. S5	5.015
Kokomo,Ind. C16	4.775
LosAngeles B3	5.475
Minnequa,Colo. C10	4.925
Monessen,Pa. P7	4.675
No.Tonawanda,N.Y.B11	4.675
Pittsburg,Calif. C11	5.325
Portsmouth P12	4.675
Roebling,N.J. R5	4.775
So.Chicago,Ill. R2	4.675
Sterling,Ill.(1) N15	4.675
Sterling,Ill. N15	4.775
Struthers,O. Y1	4.675
SparrowsPoint,Md. B2	4.775
Torrance,Calif. C11	5.475
Worcester,Mass. A7	4.975

STRUCTURALS

Carbon Steel Stand. Shapes

Ala.City,Ala. R2	*4.25*
Aliquippa,Pa. J5	4.25
Bessemer,Ala. T2	4.25
Bethlehem,Pa. B2	4.30
Birmingham C15	4.25
Clairton,Pa. U5	4.25
Fairfield,Ala. T2	4.25
Fontana,Calif. K1	4.90
Gary,Ind. U5	4.25
Geneva,Utah C11	4.25
Houston S5	4.65
Ind.Harbor,Ind. I-2	4.25
Johnstown,Pa. B2	4.30
KansasCity,Mo. S5	4.85
Lackawanna,N.Y. B2	4.30
LosAngeles B3	4.95
Minnequa,Colo. C10	4.70
Munhall,Pa. U5	4.25
Niles,Calif. P1	4.80
Phoenixville,Pa. P4	3.95
Seattle B3	5.00
So.Chicago U5, W14	4.25
So.SanFrancisco B3	4.90
Torrance,Calif. C11	4.95
Weirton,W.Va. W6	4.25

Wide Flange

Bethlehem,Pa. B2	4.30
Clairton,Pa. U5	4.25
Fontana,Calif. K1	5.25
Lackawanna,N.Y. B2	4.30
Munhall,Pa. U5	4.25
Phoenixville,Pa. P4	3.95
So.Chicago,Ill. U5	4.25

Alloy Stand. Shapes

Clairton,Pa. U5	5.20
Fontana,Calif. K1	6.60
Gary,Ind. U5	5.20
Houston S5	5.60
Munhall,Pa. U5	5.20
So.Chicago,Ill. U5	5.20

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5	6.40
Bessemer,Ala. T2	6.40
Bethlehem,Pa. B2	6.45
Clairton Pa. U5	6.40
Fairfield,Ala. T2	6.40
Fontana,Calif. K1	7.05
Gary,Ind. U5	6.40
Geneva,Utah C11	6.40
Houston S5	6.80
Ind.Harbor,Ind. I-2, Y1	6.40
Johnstown,Pa. B2	6.45
KansasCity,Mo. S5	7.00
Lackawanna,N.Y. B2	6.45
LosAngeles B3	7.10
Munhall,Pa. U5	6.40
Seattle B3	7.15
So.Chicago,Ill. U5, W14	6.40
So.SanFrancisco B3	7.05
Struthers,O. Y1	6.40

H.S., L.A. Wide Flange

Bethlehem,Pa. B2	6.45
Lackawanna,N.Y. B2	6.45
Munhall,Pa. U5	6.40
So.Chicago,Ill. U5	6.40

PILING

BEARING PILES

Munhall,Pa. U5	4.25
So.Chicago,Ill. U5	4.25

STEEL SHEET PILING

Ind.Harbor,Ind. I-2	5.075
Lackawanna,N.Y. B2	5.075
Munhall,Pa. U5	5.075
So.Chicago,Ill. U5	5.075

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2	*4.225*
Aliquippa,Pa. J5	4.225
Ashland,Ky.(15) A10	4.225
Bessemer,Ala. T2	4.225
Buffalo R2	*4.225*
Clairton,Pa. U5	4.225
Claymont,Del. C22	4.225
Cleveland J5	4.225
Cleveland R2	*4.225*
Coatesville,Pa. L7	4.225
Conshohocken,Pa. A3	4.225
Ecorse,Mich. G5	4.375
Fairfield,Ala. T2	4.225
Fontana,Calif.(30) K1	4.875
Gary,Ind. U5	4.225
Geneva,Utah C11	4.225
GraniteCity,Ill. G4	4.425
Harrisburg,Pa. C5	3.975
Houston S5	4.625
Ind.Harbor,Ind. I-2, Y1	4.225
Johnstown,Pa. B2	4.225
Lackawanna,N.Y. B2	4.225
LoneStar,Tex. L6	4.55
Mansfield,O. E6	4.225
Minnequa,Colo. C10	5.075
Munhall,Pa. U5	4.225
Newport,Ky. N9	4.225
Pittsburgh J5	4.225
Riverdale,Ill. A1	4.225
Seattle B3	5.125
Sharon,Pa. S3	4.225
So.Chicago,Ill. R2	*4.225*
So.Chicago,Ill. U5,W14	4.225
SparrowsPoint,Md. B2	4.225
Steubenville,O. W10	4.225
Warren,O. R2	*4.225*
Weirton,W.Va. W6	4.225
Youngstown R2	*4.225*
Youngstown U5, Y1	4.225

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1	6.025
Geneva,Utah C11	5.375

PLATES, Wrought Iron

Economy,Pa. B14	9.80

PLATES,High-Strength Low-Alloy

Aliquippa,Pa. J5	6.45
Bessemer,Ala. T2	6.45
Clairton,Pa. U5	6.45
Cleveland J5, R2	6.45
Conshohocken,Pa. A3	6.45
Ecorse,Mich. G5	6.60
Fairfield,Ala. T2	6.45
Fontana,Calif.(30) K1	7.15
Gary,Ind. U5	6.45
Geneva,Utah C11	6.45
Houston S5	6.85
Ind.Harbor,Ind. I-2, Y1	6.45
Johnstown,Pa. B2	6.45
Lackawanna,N.Y. B2	6.45
LosAngeles B3	7.35
Munhall,Pa. U5	6.45
Pittsburgh J5	6.45
Seattle B3	7.35
Sharon,Pa. S3	6.45
So.Chicago,Ill. U5, W14	6.45
SparrowsPoint,Md. B2	6.45
Youngstown U5, Y1	6.45

PLATES, Alloy

Claymont,Del. C22	5.80
Coatesville,Pa. L7	5.80
Fontana,Calif. K1	6.45
Gary,Ind. U5	5.80
Houston S5	6.20
Johnstown,Pa. B2	5.80
Munhall,Pa. U5	5.80
Newport,Ky. N9	5.80
Seattle B3	6.70
Sharon,Pa. S3	5.80
So.Chicago,Ill. U5, W14	5.80
SparrowsPoint,Md. B2	5.80

FLOOR PLATES

Cleveland J5	5.275
Conshohocken,Pa. A3	5.275
Harrisburg,Pa. C5	5.15
Ind.Harbor,Ind. I-2	5.275
Munhall,Pa. U5	5.275
So.Chicago,Ill. U5	5.275

PLATES, Ingot Iron

Ashland c.l. (15) A10	4.475
Ashland l.c.l. (15) A10	4.975
Cleveland c.l. R2	4.825
Warren,O. c.l. R2	4.825

BARS

BARS, Hot-Rolled Carbon

Ala.City,Ala. R2	*4.30*
Aliquippa,Pa. J5	4.30
Alton,Ill. L1	4.50
Atlanta,Ga. A11	4.50
Bessemer,Ala. T2	4.30
Birmingham C15	4.30
Buffalo R2	*4.30*
Canton,O. R2	*4.40*
Clairton,Pa. U5	4.30
Cleveland R2	*4.30*
Ecorse,Mich. G5	4.45
Emeryville,Calif. J7	5.05
Fairfield,Ala. T2	4.30
Fairless,Pa. U5	4.45
Fontana,Calif. K1	5.00
Gary,Ind. U5	4.30
Houston S5	4.70
Ind.Harbor,Ind. I-2, Y1	4.30
Johnstown,Pa. B2	4.30
KansasCity,Mo. S5	4.90
Lackawanna,N.Y. B2	4.30
LosAngeles B3	5.00
Massillon,O. R2	*4.40*
Milton,Pa. M18	4.30
Minnequa,Colo. C10	4.75
Niles,Calif. P1	4.85
N.Tonawanda,N.Y. B11	4.30
Pittsburg,Calif. C11	5.00
Pittsburgh J5	4.30
Portland,Oreg. O4	5.05
Seattle B3, N14, P23	5.05
So.Chicago R2	*4.30*
So.Chicago U5, W14	4.30
So.Duquesne,Pa. U5	4.30
So.SanFran.,Calif. B3	5.05
Sterling,Ill.(1) N15	4.30
Sterling,Ill. N15	4.40
Struthers,O. Y1	4.30
Torrance,Calif. C11	5.00
Warren,O. R2	*4.30*
Weirton,W.Va. W6	4.30
Youngstown U5	4.30
Youngstown R2	*4.30*

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2	5.075
Buffalo R2	*5.075*
Canton,O. T7	5.075
Canton,O. R2	*5.075*
Clairton,Pa. U5	5.075
Detroit R7	5.075
Ecorse,Mich. G5	5.225
Fontana,Calif. K1	6.125
Fairless,Pa. U5	5.225
Gary,Ind. U5	5.075
Houston S5	5.475
Ind.Harbor,Ind. I-2, Y1	5.075
Johnstown,Pa. B2	5.075
KansasCity,Mo. S5	5.675
Lackawanna,N.Y. B2	5.075
LosAngeles B3	6.125
Massillon,O. R2	*5.075*
Midland,Pa. C18	5.075
So,Chicago U5, W14	5.075
So.Chicago R2	*5.075*
So.Duquesne,Pa. U5	5.075
Struthers,O. Y1	5.075
Warren,O. C17	5.075
Youngstown U5	5.075

BARS & SMALL SHAPES, H.R.

High-Strength Low-Alloy

Aliquippa,Pa. J5	6.45
Bessemer,Ala. T2	6.45
Bethlehem,Pa. B2	6.45
Clairton,Pa. U5	6.45
Cleveland R2	6.45
Ecorse,Mich. G5	6.60
Fairfield,Ala. T2	6.45
Fontana,Calif. K1	7.70
Gary,Ind. U5	6.45
Houston S5	6.85
Ind.Harb.,Ind. I-2, Y1	6.45
Johnstown,Pa. B2	6.45
KansasCity,Mo. S5	7.05
Lackawanna,N.Y. B2	6.45
LosAngeles B3	7.15
Pittsburgh J5	6.45
Seattle B3	7.20
So.Chicago W14	6.45
So.Duquesne,Pa. U5	6.45
So.SanFrancisco B3	7.20
Struthers,O. Y1	6.45
Warren,O. R2	6.45
Youngstown U5	6.45

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2	4.45

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5	4.30
Atlanta A11	4.50
Fontana,Calif. K1	5.00
Niles,Calif. P1	4.85
SanFrancisco S7	4.70

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5	5.20
Gary,Ind. U5	5.20
Houston S5	5.60
KansasCity S5	5.80
Youngstown U5	5.20

BARS, Cold-Finished Carbon

Ambridge,Pa. W18	5.40
BeaverFalls,Pa. M12	5.40
BeaverFalls,Pa. R2	*5.40*
Camden,N.J. P13	5.85
Carnegie,Pa. C12	5.40
Chicago W18	5.40
Cleveland A7, C20	5.40
Detroit R7	5.40
Detroit B5, P17	5.60
Donora,Pa. A7	5.40
Elyria,O. W8	5.40
FranklinPark,Ill. N5	5.40
Gary,Ind. R2	*5.40*
GreenBay,Wis. F7	5.40
Hammond,Ind. L2, M13	5.40
Hartford,Conn. R2	5.90
Harvey,Ill. B5	5.40
LosAngeles R2	6.85
LosAngeles S30	6.85
Mansfield,Mass. B5	5.95
Massillon,O. R8	5.40
Massillon,O. R2	*5.40*
Monaca,Pa. S17	5.40
Newark,N.J. W18	5.85
NewCastle,Pa.(17) B4	5.40
Pittsburgh J5	5.40
Plymouth,Mich. P5	5.65
Putnam,Conn. W18	5.95
Readville,Mass. C14	5.95
St.Louis,Mo. M5	5.70
So.Chicago,Ill. W14	5.40
SpringCity,Pa. K3	5.85
Struthers,O. Y1	5.40
Waukegan,Ill. A7	5.40
Worcester,Mass. W19	5.85
Youngstown F3, Y1	5.40

BARS, Cold-Finished Alloy

(Turned and Ground)

Cumberland,Md.(5) C19	4.65

BARS, Cold-Finished Alloy

Ambridge,Pa. W18	6.625
BeaverFalls,Pa. M12	6.625
BeaverFalls,Pa. R2	*6.625*
Bethlehem,Pa. B2	6.625
Buffalo B5	6.625
Camden,N.J. P13	6.80
Canton,O. T7	6.625
Carnegie,Pa. C12	6.625
Chicago W18	6.625
Cleveland A7, C20	6.625
Detroit R7	6.625
Detroit B5, P17	6.825
Donora,Pa. A7	6.625
Elyria,O. W8	6.625
Gary,Ind. R2	*6.625*
Hammond,Ind. L2, M13	6.625
Hartford,Conn. R2	*6.625*
Harvey,Ill. B5	6.625
Lackawanna,N.Y. B2	6.625
LosAngeles S30	8.30
Mansfield,Mass. B5	6.925
Massillon,O. R8	6.625
Massillon,O. R2	*6.625*
Midland,Pa. C18	6.625
Monaca,Pa. S17	6.625
Newark,N.J. W18	6.80
Plymouth,Mich. P5	6.825
So.Chicago W14	6.625
SpringCity,Pa. K3	6.80
Struthers,O. Y1	6.625
Warren,O. C17	6.625
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925
Youngstown F3, Y1	6.625

BARS, Reinforcing (fabricators)

Ala.City,Ala. R2	*4.30*
Atlanta A11	4.50
Birmingham C15	4.30
Buffalo R2	*4.30*
Cleveland R2	*4.30*
Emeryville,Calif. J7	5.05
Fairfield,Ala. T2	4.30
Fairless,Pa. U5	4.45
Fontana,Calif. K1	5.00
Ft.Worth,Tex.(42) T4	4.90
Gary,Ind. U5	4.30
Houston S5	4.70

Ind.Harbor,Ind. I-2, Y1	4.30
Johnstown,Pa. B2	4.30
KansasCity,Mo. S5	4.90
Lackawanna,N.Y. B2	4.30
LosAngeles B3	5.00
Milton,Pa. M18	4.30
Minnequa,Colo. C10	4.75
Niles,Calif. P1	4.85
Pittsburg,Calif. C11	5.00
Pittsburgh J5	4.30
SandSprings,Okla. S5	5.15
Seattle B3, N14, P23	5.05
So.Chicago R2	*4.30*
So.Duquesne,Pa. U5	4.30
So.SanFrancisco B3	5.05
SparrowsPoint,Md. B2	4.30
Sterling,Ill.(1) N15	4.30
Sterling,Ill. N15	4.40
Struthers,O. Y1	4.30
Torrance,Calif. C11	5.00
Youngstown U5	4.30
Youngstown R2	*4.30*

BARS, Reinforcing (Fabricated; to consumers)

Johnstown,Pa., ¼-1" B2	5.70
KansasCity S5	6.50
LosAngeles B3	5.95
Marion,O. P11	5.55
Seattle B3, N14, P23	6.15
So.SanFrancisco B3	6.00
SparrowsPt. ½-1" B2	5.70
Williampsort,Pa. S19	5.60

RAIL STEEL BARS

Avis,Pa.(3) J8	4.25
ChicagoHts.(3) C2, I-2	4.20
ChicagoHts.(4) C2, I-2	4.30
Ft.Worth,Tex(26) T4	4.75
Franklin,Pa. (3) F5	4.05
Franklin,Pa. (4) F5	4.15
Marion,O.(3) P11	4.15
Moline,Ill.(3) R2	4.30
Tonawanda(3) B12	*4.15*
Tonawanda(4) B12	4.30
Williamsport,Pa.(3) S19	4.30

BARS, Wrought Iron

Economy,Pa.(S.R.) B14	10.85
Economy,Pa.(D.R.) B14	13.50
Economy(Staybolt) B14	13.80
McK.Rks.(S.R.) L5	10.85
McK.Rks.(D.R.) L5	14.75
McK.Rks.(Staybolt) L5	16.25

SHEETS

SHEETS, Hot-Rolled Steel (18 gage and heavier)

Allenport,Pa. P7	4.05
Ashland,Ky.(8) A10	4.05
Cleveland J5, R2	4.05
Conshohocken,Pa. A3	4.10
Detroit(8) M1	4.20
Ecorse,Mich. G5	4.20
Fairfield,Ala. T2	4.05
Fairless,Pa. U5	4.10
Fontana,Calif. K1	4.825
Gadsden,Ala. R2	4.05
Gary,Ind. U5	4.05
Geneva,Utah C11	4.15
GraniteCity,Ill. G4	4.25
Houston S5	4.45
Ind.Harbor,Ind. I-2, Y1	4.05
Irvin,Pa. U5	4.05
Kokomo,Ind. C16	4.15
Lackawanna,N.Y. B2	4.05
Mansfield,O. E6 (37)	4.05
Mansfield,O. E6 (38)	4.80
Munhall,Pa. U5	4.05
Newport,Ky. N9	4.05
Niles,O. N12	4.05
Pittsburg,Calif. C11	4.75
Pittsburgh J5	4.05
Portsmouth,O. P12	4.05
Riverdale,Ill. A1	4.05
Sharon,Pa. S3	4.05
So.Chicago,Ill. W14	4.05
SparrowsPoint,Md. B2	4.05
Steubenville,O. W10	4.05
Warren,O. R2	4.05
Weirton,W.Va. W6	4.05
Youngstown U5, Y1	4.05

SHEETS, H.R. (19 ga. lighter)

Gadsden,Ala. R2	5.35
Kokomo,Ind. C16	5.20
Niles,O. N12	4.95

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy

Cleveland J5, R2	6.10
Conshohocken,Pa. A3	6.15
Ecorse,Mich. G5	6.25
Fairfield,Ala. T2	6.10
Fairless,Pa. U5	6.15
Fontana,Calif. K1	6.875
Gary,Ind. U5	6.10
Ind.Harbor,Ind. I-2, Y1	6.10
Irvin,Pa. U5	6.10
Lackawanna(35) B2	6.10
Munhall,Pa. U5	6.10
Pittsburgh J5	6.10
Sharon,Pa. S3	6.10
So.Chicago,Ill. U5	6.10
SparrowsPoint(36) B2	6.10
Warren,O. R2	6.10
Weirton,W.Va. W6	6.10
Youngstown U5, Y1	6.10

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10	4.30
Cleveland R2	4.65
Ind.Harbor,Ind. I-2	4.30
Warren,O. R2	4.65

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7	4.95
Cleveland J5, R2	4.95
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	4.95
Fairless,Pa. U5	5.00
Follansbee,W.Va. F4	4.95
Fontana,Calif. K1	6.05
Gary,Ind. U5	4.95
GraniteCity,Ill. G4	5.15
Ind.Harbor,Ind. I-2, Y1	4.95
Irvin,Pa. U5	4.95
Lackawanna,N.Y. B2	4.95
Middletown,O. A10	4.95
Pittsburg,Calif. C11	5.90
Pittsburgh J5	4.95
Portsmouth,O. P12	4.95
SparrowsPoint,Md. B2	4.95
Steubenville,O. W10	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown Y1	4.95

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2	7.50
Ecorse,Mich. G5	7.65
Fairless,Pa. U5	7.55
Fontana,Calif. K1	8.55
Gary,Ind. U5	7.50
IndianaHarbor,Ind. Y1	7.50
Irvin,Pa. U5	7.50
Lackawanna(37) B2	7.50
Pittsburgh J5	7.50
SparrowsPoint(38) B2	7.50
Warren,O. R2	7.50
Weirton,W.Va. W6	7.50
Youngstown Y1	7.50

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	5.55
Middletown,O. A10	5.45
Warren,O. R2	5.55

SHEETS, Culvert (16 Ga.)

	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.50	....
Canton,O. R2	6.25	7.10
Fairfield T2	*5.70*	
Gary,Ind. U5	*5.50*	*5.95*
Ind.Harbor I-2	6.25	6.50
Irvin,Pa. U5	*5.70*	
Kokomo,Ind. C16	6.35	....
MartinsFry.,O. W10	6.25	....
Newport,Ky. N9	6.25	6.50
Pitts.,Calif. C11	*6.45*	
SparrowsPt. B2	6.25	....

SHEETS, Culvert

	Pure Iron
Ashland,Ky. A10	6.75
MartinsFerry,O. W10	6.50
Gary,Ind. U5	*5.95*

SHEETS, Galvanized Steel Hot-dipped

Ashland,Ky. A10	5.45*
Butler,Pa. A10	5.45†
Canton,O. R2	5.45‡
Dover,O. R1	5.45‡
Fairfield,Ala. T2	5.45*
Gadsden,Ala. R2	5.45‡
Gary,Ind. U5	5.45*
GraniteCity,Ill. G4	5.65‡
Ind.Harbor,Ind. I-2	5.45†
Irvin,Pa. U5	5.45†
Kokomo,Ind. C16	5.55‡
MartinsFerry,O. W10	5.45*
Middletown,O. A10	5.45†
Newport,Ky. N9	5.45†
Niles,O. N12	5.45‡
Pittsburg,Calif. C11	6.20‡
SparrowsPt.,Md. B2	5.45‡
Steubenville,O. W10	5.45‡
Weirton,W.Va. W6	5.45*

*Continuous and noncontinuous. †Continuous. ‡ Noncontinuous.

SHEETS, Galvanized High-Strength Low-Alloy

Irvin,Pa. U5	8.20
SparrowsPoint(39) B2	8.20

SHEETS, Galvannealed Steel

Canton,O. R2	5.85
Irvin,Pa. U5	5.85
Kokomo,Ind. C16	5.95†
Newport,Ky. N9	6.00
Niles,O. N12	6.00

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10	5.70
Canton,O. R2	6.20

SHEETS, Galvanized Ingot Iron (Hot-dipped continuous)

Ashland,Ky. A10	5.70
Butler,Pa. A10	5.70
Middletown,O. A10	5.70

SHEETS, Electrogalvanized

Cleveland(28) R2	6.30
Niles,O.(28) R2	6.30
Weirton,W.Va. W6	5.975

SHEETS, Aluminum Coated

Butler,Pa. A10	8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	5.375
Cleveland R2	5.375
Gary,Ind. U5	5.375
GraniteCity,Ill. G4	5.575
Ind.Harbor,Ind. I-2	5.375
Irvin,Pa. U5	5.375
Middletown,O. A10	5.375
Niles,O. N12	5.375
Youngstown Y1	5.375

BLUED STOCK, 29 ga.

Follansbee,W.Va. F4	7.375
Follansbee(23) F4	6.60
Yorkville,O. W10	7.375

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.85
Gary,Ind. U5	5.85
Mansfield,O. E6	5.85
Middletown,O. A10	5.85
Niles,O. N12	5.85
Weirton,W.Va. W6	5.85

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	6.25

SHEETS, Well Casing

Fontana,Calif. K1	6.325

Key to Producers

A1	Acme Steel Co.
A3	Alan Wood Steel Co.
A4	Allegheny Ludlum Steel
A5	Alloy Metal Wire Co.
A7	American Steel & Wire
A8	Anchor Drawn Steel Co.
A9	Angell Nail & Chaplet
A10	Armco Steel Corp.
A11	Atlantic Steel Co.
B1	Babcock & Wilcox Co.
B2	Bethlehem Steel Co.
B3	Beth. Pac. Coast Steel
B4	Blair Strip Steel Co.
B5	Bliss & Laughlin Inc.
B8	Braeburn Alloy Steel
B9	Brainard Steel Div., Sharon Steel Corp.
B10	E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11	Buffalo Bolt Co., Div. Buffalo-Eclipse Corp.
B12	Buffalo Steel Corp.
B14	A. M. Byers Co.
B15	J. Bishop & Co.
C1	Calstrip Steel Corp.
C2	Calumet Steel Div., Borg-Warner Corp.
C4	Carpenter Steel Co.
C5	Central Iron & Steel Div. Barium Steel Corp.
C7	Cleve. Cold Rolling Mills
C8	Cold Metal Products Co.
C9	Colonial Steel Co.
C10	Colorado Fuel & Iron
C11	Columbia-Geneva Steel
C12	Columbia Steel & Shaft.
C13	Columbia Tool Steel Co.
C14	Compressed Steel Shaft.
C15	Connors Steel Div. H. K. Porter Co. Inc.
C16	Continental Steel Corp.
C17	Copperweld Steel Co.
C18	Crucible Steel Co.
C19	Cumberland Steel Co.
C20	Cuyahoga Steel & Wire
C22	Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23	Charter Wire Inc.
C24	G. O. Carlson Inc.
C31	Chester Blast Furnace Inc.
D2	Detroit Steel Corp.
D3	Detroit Tube & Steel
D4	Disston & Sons, Henry
D6	Driver Harris Co.
D7	Dickson Weatherproof Nail Co.
D8	Damascus Tube Co.
D9	Wilbur B. Driver Co.
E1	Eastern Gas&FuelAssoc.
E2	Eastern Stainless Steel
E4	Electro Metallurgical Co.
E5	Elliott Bros. Steel Co.
E6	Empire Steel Corp.
F2	Firth Sterling Inc.
F3	Fitzsimons Steel Co.
F4	Follansbee Steel Corp.
F5	Franklin Steel Div., Borg-Warner Corp.
F6	Fretz-Moon Tube Co.
F7	Ft. Howard Steel & Wire
F8	Ft. Wayne Metals Inc.
G2	Globe Iron Co.
G4	Granite City Steel Co.
G5	Great Lakes Steel Corp.
G6	Greer Steel Co.
H1	Hanna Furnace Corp.
H7	Helical Tube Co.
I-1	Igoe Bros. Inc.
I-2	Inland Steel Co.
I-3	Interlake Iron Corp.
I-4	Ingersoll Steel Div., Borg-Warner Corp.
I-6	Ivins, E., Steel Tube
I-7	Indiana Steel & Wire Co.
J1	Jackson Iron & Steel Co.
J3	Jessop Steel Co.
J4	Johnson Steel & Wire Co.
J5	Jones & Laughlin Steel
J6	Joslyn Mfg. & Supply
J7	Judson Steel Corp.
J8	Jersey Shore Steel Co.
K1	Kaiser Steel Corp.
K2	Keokuk Electro-Metals
K3	Keystone Drawn Steel
K4	Keystone Steel & Wire
K7	Kenmore Metals Corp.
L1	Laclede Steel Co.
L2	LaSalle Steel Co.
L3	Latrobe Steel Co.
L5	Lockhart Iron & Steel
L6	Lone Star Steel Co.
L7	Lukens Steel Co.
M1	McLouth Steel Corp.
M4	Mahoning Valley Steel
M5	Medart Co.
M6	Mercer Pipe Div., Sawhill Tubular Products
M8	Mid-States Steel & Wire
M12	Moltrup Steel Products
M13	Monarch Steel Co.
M14	McInnes Steel Co.
M16	Md. Fine&Special. Wire
M17	Metal Forming Corp.
M18	Milton Steel Prod. Div., Merritt-Chapman&Scott
N1	National-Standard Co.
N2	National Supply Co.
N3	National Tube Div.
N5	Nelsen Steel & Wire Co.
N6	NewEng. HighCarb.Wire
N8	Newman-Crosby Steel
N9	Newport Steel Corp.
N12	Niles Rolling Mill Div.
N14	Nrthwst.Steel Roll. Mills
N15	Northwestern S.&W. Co.
N16	New Delphos Mfg. Co.
O3	Oliver Iron & Steel Corp.
O4	Oregon Steel Mills
P1	Pacific States Steel Corp.
P2	Pacific Tube Co.
P4	Phoenix Iron & Steel Co.
P5	Pilgrim Drawn Steel
P6	Pittsburgh Coke&Chem.
P7	Pittsburgh Steel Co.
P11	Pollak Steel Co.
P12	Portsmouth Division Detroit Steel Corp.
P13	Precision Drawn Steel
P14	Pitts. Screw & Bolt Co.
P15	Pittsburgh Metallurgical
P16	Page Steel & Wire Div., Amer. Chain & Cable
P17	Plymouth Steel Co.
P19	Pitts. Rolling Mills
P20	Prod. Steel Strip Corp.
P23	Pacific Steel Rolling
R1	Reeves Steel & Mfg. Co.
R2	Republic Steel Corp.
R3	Rhode Island Steel Corp.
R5	Roebling's Sons, John A.
R6	Rome Strip Steel Co.
R7	Rotary Electric Steel Co.
R8	RelianceDiv.,EatonMfg.
R9	Rome Mfg. Co.
R10	Rodney Metals Inc.
S1	Seneca Wire & Mfg. Co.
S3	Sharon Steel Corp.
S4	Sharon Tube Co.
S5	Sheffield Steel Div. Armco Steel Corp.
S6	Shenango Furnace Co.
S7	Simmons Co.
S8	Simonds Saw & Steel Co.
S12	Spencer Wire Corp.
S13	Standard Forgings Corp.
S14	Standard Tube Co.
S15	Stanley Works
S17	Superior Drawn Steel Co.
S18	Superior Steel Corp.
S19	Sweet's Steel Co.
S20	Southern States Steel
S23	Superior Tube Co.
S25	Stainless WeldedProducts
S26	Specialty Wire Co. Inc.
S30	Sierra Drawn Steel Corp.
T2	Tenn. Coal & Iron Div.
T3	Tenn.Prod. & Chem.
T4	Texas Steel Co.
T5	Thomas Strip Division, Pittsburgh Steel Co.
T6	Thompson Wire Co.
T7	Timken Roller Bearing
T9	Tonawanda Iron Div. Am. Rad. & Stan.San.
T13	Tube Methods Inc.
U4	Universal-Cyclops Steel
U5	United States Steel Corp.
U6	U. S. Pipe & Foundry
U7	Ulbrich Stainless Steels
V2	Vanadium-Alloys Steel
V3	Vulcan Crucible Steel Co.
W1	Wallace Barnes Co.
W2	Wallingford Steel Co.
W3	Washburn Wire Co.
W4	Washington Steel Corp.
W6	Weirton Steel Co.
W7	W.Va. Steel & Mfg. Co.
W8	West.Auto.Mach.Screw
W9	Wheatland Tube Co.
W10	Wheeling Steel Corp.
W12	Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13	Wilson Steel & Wire Co.
W14	Wisconsin Steel Div., International Harvester
W15	Woodward Iron Co.
W18	Wyckoff Steel Co.
W19	Worcester Pressed Steel
Y1	Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Allenport,Pa. P7	4.05
Alton,Ill. L1	4.225
Ashland,Ky.(8) A10	4.05
Atlanta A11	4.25
Bessemer,Ala. T2	4.05
Birmingham C15	4.05
Bridgeport,Conn.(10)S15	4.05
Buffalo(27) R2	4.05
Conshohocken,Pa. A3	4.175
Detroit M1	4.20
Ecorse,Mich. G5	4.20
Fairfield,Ala. T2	4.05
Fontana,Calif. K1	4.825
Gadsden,Ala.(27) R2	4.05
Gary,Ind. U5	4.05
Houston,Tex. S5	4.45
Ind.Harbor,Ind. I-2, Y1	4.05
Johnstown,Pa.(25) B2	4.05
KansasCity,Mo.(9) S5	4.65
Lackw'na,N.Y.(25) B2	4.05
LosAngeles(25) B3	4.80
Milton,Pa. M18	4.05
Minnequa,Colo. C10	5.15
NewBritain(10) S15	4.05
N.Tonawanda,N.Y. B11	4.05
Pittsburg,Calif. C11	4.80
Portsmouth,O. P12	4.05
Riverdale,Ill. A1	4.05
SanFrancisco S7	5.00
Seattle(25) B3, P23	5.05
Seattle N14	5.05
Sharon,Pa. S3	4.05
So.Chicago,Ill. W14	4.05
So.SanFrancisco(25) B3	4.80
SparrowsPoint,Md. B2	4.05
Sterling(1) N15	4.05
Sterling,Ill. N15	4.15
Torrance,Calif. C11	4.80
Warren,O. R2	4.05
Weirton,W.Va. W6	4.05
Youngstown U5	4.05

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10)S15	6.45
Carnegie,Pa. S18	6.70
Fontana,Calif. K1	8.10
Gary,Ind. U5	6.70
Houston,Tex. S5	7.10
KansasCity,Mo. S5	7.30
LosAngeles B3	7.90
NewBritn.,Conn.(10)S15	6.45
Newport,Ky. N9	6.70
Seattle P23	7.80
Sharon,Pa. S3	6.70
So.Chicago W14	6.70
Youngstown U5	6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.15
Conshohocken,Pa. A3	6.15
Ecorse,Mich. G5	6.30
Fairfield,Ala. T2	6.15
Fontana,Calif. K1	7.25
Gary,Ind. U5	6.15
Houston S5	6.55
Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.75
Lackawanna,N.Y. B2	6.15
LosAngeles(25) B3	6.90
Seattle(25) B3, P23	7.15
Sharon,Pa. S3	6.15
So.SanFrancisco(25) B3	6.90
SparrowsPoint,Md. B2	6.15
Warren,O. R2	6.15
Weirton,W.Va. W6	6.15
Youngstown U5, Y1	6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.30
Warren,O. R2	4.65

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	5.75
Baltimore T6	5.75
Bridgeport,Conn.(10)S15	5.75
Cleveland A7, J5	5.75
Dearborn,Mich. D3	5.90
Detroit D2, M1	5.90
Detroit P20	5.95
Dover,O. G6	5.75
Ecorse,Mich. G5	5.90
Follansbee,W.Va. F4	5.75
Fontana,Calif. K1	7.65
FranklinPark,Ill T6	5.85
Ind.Harbor,Ind. I-2	6.00
Indianapolis C8	5.90
Lackawanna,N.Y. B2	5.75
LosAngeles C1	7.80
Mattapan,Mass. T6	6.30
Middletown,O. A10	5.75
NewBedford,Mass. R10	6.20
NewBritain(10) S15	5.75
NewCastle,Pa. B4, E5	5.75
NewHaven,Conn. A7	6.50
NewHaven,Conn. D2	6.20
Pawtucket,R.I. R3	6.40
Pawtucket,R.I. N8	6.30
Pittsburgh J5	5.75
Portsmouth,O. P12	5.75
Riverdale,Ill. A1	5.85
Rome,N.Y.(32) R6	5.75
Sharon,Pa. S3	5.75
SparrowsPt. Md. B2	5.75
Trenton,N.J. R5	7.00
Wall'ford,Conn. W2	6.20
Warren,O. B9, R2, T5	5.75
Weirton,W.Va. W6	5.75
Worcester,Mass. A7	6.60
Youngstown C8, Y1	5.75

STRIP, Cold-Rolled Alloy

Carnegie,Pa. S18	12.45
Cleveland A7	12.45
Dover,O. G6	12.45
Fontana,Calif. K1	14.55
FranklinPark,Ill. T6	12.45
Harrison,N.J. C18	12.45
Mattapan,Mass. T6	12.80
Pawtucket,R.I. N8	12.80
Sharon,Pa. S3	12.45
Worcester,Mass. A7	12.75
Youngstown C8	12.90

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5	8.60
Dearborn,Mich. D3	8.75
Dover,O. G6	8.60
Ecorse,Mich. G5	8.75
Lackawanna,N.Y. B2	8.425
Pittsburgh J5	8.60
Sharon,Pa. S3	8.60
SparrowsPoint,Md. B2	8.425
Warren,O. R2	8.60
Weirton,W.Va. W6	8.60
Youngstown Y1	8.60

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	6.35

STRIP, Electrogalvanized

Dover,O. G6	5.75
Youngstown C8	5.75

TIGHT COOPERAGE HOOP

Atlanta A11	4.775
Riverdale,Ill. A1	4.625
Sharon,Pa. S3	4.475
Youngstown U5	4.475

STRIP, Cold-Finished Spring Steel (Annealed)	**0.26-0.40C**	**0.41-0.60C**	**0.61-0.80C**	**0.81-1.05C**	**1.06-1.35C**
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Bridgeport,Conn.(10) S15	5.75	8.05	9.30	11.15	13.85
Bristol,Conn. W1	...	...	9.30	11.45	....
Carnegie,Pa. S18	...	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	...	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.90	8.25	9.20	....	....
Detroit D2	5.90	8.25	9.20	10.95	....
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	6.00	8.20	9.00	11.15	13.85
Mattapan,Mass. T6	6.30	8.35	9.30	11.45	14.15
NewBritn.,Conn.(10) S15	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	....
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	....
NewYork W3	...	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill.(1) A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	...	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	10.95	13.25
Weirton,W.Va. W6	5.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7	6.60	8.35	9.30	11.45	14.15
Worcester,Mass. T6	6.30	8.35	9.30	11.45	14.15
Youngstown C8	5.85	8.05	9.00	11.15	13.85
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	...	...	12.90	....	....
Harrison,N.J. C18	...	...	12.90	15.60	19.00
NewYork W3	...	...	12.90	15.60	19.00
Trenton,N.J. R5	...	...	12.90	15.60	19.00
Worcester,Mass. T6	...	...	12.90	15.60	19.00
Worcester,Mass. W12	...	...	12.90	....	....
Youngstown C8	...	...	13.25	15.95	19.35

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	**Field**	**Armature**	**Electric**	**Motor**	**Dynamo**
BeechBottom,W.Va. W10	...	...	9.10	10.10	11.00
Brackenridge,Pa. A4	...	...	9.10	10.10	11.00
IndianaHarbor,Ind. I-2	8.025	8.50	9.10	10.10	....
Mansfield,O. E6	8.025	8.50	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.50	9.10	10.10	11.00
Niles,O. N12	8.025	8.50	9.10	10.10	....
Vandergrift,Pa. U5	...	8.50	9.10	10.10	11.00
Warren,O. R2	8.025	8.50	9.10	10.10	11.00
Zanesville,O. A10	...	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	**Field**	**Armature**	**Electric**	**Motor**	**Dynamo**
Brackenridge,Pa. A4	...	...	9.85	10.85	11.75
GraniteCity,Ill. G4	8.425*	8.95*	9.55*	10.55*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	...	9.25†	9.85†	10.85†	11.75†
Vandergrift,Pa. U5	8.225*	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.225†	9.25	9.85	10.85	11.75
Zanesville,O. A10	...	9.25	9.85	10.85	11.75

	Transformer Grade			
H.R. SHEETS (22 Ga., cut lengths)	**T-72**	**T-65**	**T-58**	**T-52**
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge, Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95§	12.50§	13.00§	14.00§

C.R. COILS & CUT LENGTHS	**T-100**	**T-90**	**T-80**	**T-73**	**T-72**
Butler,Pa. A10	....	....	16.60	17.10	....
Vandergrift,Pa. U5	14.00	15.00	16.60	17.10	12.70
Warren,O. R2	....	....	....	....	12.70‡

* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed ½c lower. § Coils, ¾-cent higher.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	**0.25 lb**	**0.50 lb**	**0.75 lb**
Aliquippa,Pa. J5	*$7.50*	*$7.75*	*$8.15*
Fairfield,Ala. T2	*7.60*	*7.85*	*8.25*
Fairless,Pa. U5	*7.60*	*7.85*	*8.25*
Gary,Ind. U5	*7.50*	*7.75*	*8.15*
GraniteCity,Ill. G4	*7.70*	*7.95*	*8.35*
IndianaHarbor,Ind. I-2, Y1	*7.50*	*7.75*	*8.15*
Irvin,Pa. U5	*7.50*	*7.75*	*8.15*
Niles,O. R2	*7.50*	*7.75*	*8.15*
Pittsburg,Calif. C11	*8.25*	*8.50*	*8.90*
SparrowsPoint,Md. B2	*7.60*	*7.85*	*8.25*
Weirton,W.Va. W6	*7.50*	*7.75*	*8.15*
Yorkville,O. W10	*7.50*	*7.75*	*8.15*
ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	*6.175*		
Niles,O. R2	*6.175*	*6.375*	*6.575*

TIN PLATE, American Coke (Base Box)	**1.25 lb**	**1.50 lb**
Aliquippa,Pa. J5	*$8.50*	*$9.05*
Fairfield,Ala. T2	*8.90*	*9.15*
Fairless,Pa. U5	*8.90*	*9.15*
Gary,Ind. U5	*8.80*	*9.05*
Ind.Har. I-2, Y1	*8.80*	*9.05*
Irvin,Pa. U5	*8.80*	*9.05*
Pitts.,Cal. C11	*9.55*	*9.80*
Sp.Pt.,Md. B2	*8.90*	*9.15*
Warren,O. R2	*8.80*	*9.05*
Weirton,W.Va. W6	*8.80*	*9.05*
Yorkville,O. W10	*8.80*	*9.05*

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	*$6.60*
Fairfield,Ala. T2	*6.70*
Fairless,Pa. U5	*6.70*
Gary,Ind. U5	*6.60*
GraniteCity,Ill. G4	*6.80*
Ind.Harbor,Ind. I-2, Y1	*6.60*
Irvin,Pa. U5	*6.60*
Niles,O. R2	*6.60*
Pittsburg,Calif. C11	*7.35*
Warren,O. R2	*6.60*
SparrowsPoint,Md. B2	*6.70*
Weirton,W.Va. W6	*6.60*
Yorkville,O. W10	*6.60*

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	*6.20*
Gary,Ind. U5	*6.20*
GraniteCity,Ill. G4	*6.40*
Ind.Harbor,Ind. Y1	*6.20*
Irvin,Pa. U5	*6.20*
Yorkville,O. W10	*6.20*

MANUFACTURING TERNES (Special Coated; Base Box)

Gary,Ind. U5	*$7.85*
Irvin,Pa. U5	*7.85*
Yorkville,O. W10	*7.85*

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	*$8.75*

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.75

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.75
Aliquippa,Pa. J5	5.75
Alton,Ill. L1	5.925
Atlanta A11	5.95
Bartonville,Ill. K4	5.85
Buffalo W12	5.75
Chicago W13	5.75
Cleveland A7, C20	5.75
Crawfordsville,Ind. M8	5.85
Donora,Pa. A7	5.75
Duluth,Minn. A7	5.75
Fairfield,Ala. T2	5.75
Fostoria,O.(24) S1	5.95
Houston S5	6.15
Jacksonville,Fla. M8	6.27
Joliet,Ill. A7	5.75
KansasCity, Mo. S5	6.35
Kokomo,Ind. C16	5.85
LosAngeles B3	6.70
Minnequa,Colo. C10	6.00
Monessen,Pa. P7	5.75
Newark 6-8 ga. I-1	6.40
No.Tonawanda B11	5.75
Palmer,Mass. W12	6.05
Pittsburg,Calif. C11	6.70
Portsmouth,O. P12	5.75
Rankin,Pa. A7	5.75
So.Chicago,Ill. R2	5.75
So.SanFrancisco C10	6.70
SparrowsPoint,Md. B2	5.85
Sterling,Ill.(1) N15	5.75
Sterling,Ill. N15	5.85
Struthers,O. Y1	5.75
Waukegan,Ill. A7	5.75
Worcester,Mass. A7	6.05

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.20
Alton,Ill. L1	7.375
Bartonville,Ill. K4	7.30
Buffalo W12	7.20
Cleveland A7	7.20
Donora,Pa. A7	7.20
Duluth,Minn. A7	7.20
Fostoria,O. S1	7.20
Johnstown,Pa. B2	7.20
LosAngeles B3	8.15
Millbury,Mass.(12) N6	7.50
Minnequa,Colo. C10	7.45
Monessen,Pa. P7, P16	7.20
Muncie,Ind. I-7	7.40
Palmer,Mass. W12	7.50
Pittsburg,Calif. C11	8.15
Portsmouth,O. P12	7.20
Roebling,N.J. R5	7.50
So. Chicago,Ill. R2	7.20
So.SanFran. C10	8.15
SparrowsPt., Md. B2	7.30
Struthers,O. Y1	7.20
Trenton,N.J. A7	7.50
Waukegan,Ill. A7	7.20
Worcester A7,J4,T6,W12	7.50

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.90
Alton,Ill. L1	7.075
Buffalo W12	6.90
Cleveland A7	6.90
Donora,Pa. A7	6.90
Duluth,Minn. A7	6.90
Johnstown,Pa. B2	6.90
KansasCity,Mo. S5	7.50
LosAngeles B3	7.85
Minnequa,Colo. C10	7.075
Monessen,Pa. P7, P16	6.90
NewHaven,Conn. A7	7.20
Palmer,Mass. W12	7.20
Pittsburg,Calif. C11	7.85
Portsmouth,O. P12	6.90
Roebling,N.J. R5	7.20
So.Chicago,Ill. R2	6.90
So.SanFrancisco C10	7.85
SparrowsPoint,Md. B2	7.00
Trenton,N.J. A7	7.20
Waukegan,Ill. A7	6.90
Worcester,Mass. A7	7.20

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	11.375
Bartonville,Ill. K4	11.30
Buffalo W12	11.20
Chicago W13	11.20
Cleveland A7	11.20
Crawfordsville,Ind. M8	11.30
Fostoria,O. S1	11.20
Jacksonville,Fla. M8	11.73
Johnstown,Pa. B2	11.20
Kokomo,Ind. C16	11.20
Minnequa,Colo. C10	10.95
Monessen,Pa. P16	11.20
Muncie,Ind. I-7	11.40
Palmer,Mass. W12	11.50
Roebling,N.J. R5	11.50
So.SanFrancisco C10	11.55
Waukegan,Ill. A7	11.20
Worcester,Mass. A7,T6	11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	9.90
Buffalo W12	9.90
Johnstown,Pa. B2	9.90
Minnequa,Colo. C10	10.025
Monessen,Pa. P16	9.90
Muncie,Ind. I-7	10.10
Portsmouth,O. D2	9.90
Roebling,N.J. R5	10.20
SparrowsPt.,Md. B2	10.00

ROPE WIRE	**(A)**
Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo W12	9.75
Fostoria,O. S1	9.75
Johnstown,Pa. B2	9.75
Monessen,Pa. P7	9.35
Monessen,Pa. P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Portsmouth,O. P12	9.35
Roebling,N.J. R5	10.05
SparrowsPt. B2	9.85
Struthers,O. Y1	9.75
Worcester J4, T6	6.65

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE

(Continued)

WIRE, Tire Bead

Alton,Ill. L1	12.75
Bartonville,Ill. K4	13.25
Monessen, Pa. P16	13.15
Portsmouth,O. P12	13.15
Roebling,N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville,Ind M8	8.05
Dover,O. G6	7.95
Fostoria,O. S1	7.95
Kokomo,Ind. C16	8.05
FranklinPark,Ill. T6	8.05
Massillon,O. R8	7.95
Milwaukee C23	8.15
Monessen,Pa. P7, P16	7.95
Pawtkt.,R.I. N8	8.25
Rome,N.Y (32) R6	7.95
Trenton,N.J. R5	8.25
Worcester A7, T6, W12	8.25

WIRE, Merchant Quality

(6 to 8 gage)	An'ld.	Galv.
Ala.City,Ala. R2	6.90	7.30**
Aliquippa J5	6.90	7.425§
Atlanta A11	7.00	7.55
Bartonville(48) K4	7.00	7.55
Buffalo W12	6.90	7.30†
Cleveland A7	6.90	....
Crawfordsville M8	7.00	7.55
Donora.Pa. A7	6.90	7.30†
Duluth,Minn. A7	6.90	7.30†
Fairfield T2	6.90	730†
Houston,Tex. S5	7.30	7.70†
Jacks'ville,Fla. M8	7.425	7.95
JohnstownB2(48)	6.90	7.45*
Joliet,Ill. A7	6.90	7.30†
KansasCity,Mo. S5	7.50	7.90†
Kokomo C16	7.00	7.40†
LosAngeles B3	7.85	....
Minnequa C10	7.15	7.55**
Monessen P7 (48)	6.90	7.45
Palmer W12	7.20	7.60†
Pitts.,Calif. C11	7.85	8.25†
Portsmouth,O. P12	6.90	....
Rankin A7	6.90	7.30†
So.Chi'go R2	6.90	7.30**
S.S.Frn. C10	7.85	8.25**
Spar'wsPt.B2(48)	7.00	7.55*
Str'g(1)(48)N15	6.90	7.45
Struthers,O.(48)Y1	6.90	7.40‡
Worcester A7	7.20	....

* Based on 11c zinc; † 5c zinc; ‡ Less than 10c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½Ga.

	Col.
Ala.City,Ala. R2	146**
Ala.City, 17 ga. R2	241**
Ala.City, 18 ga. R2	251**
Aliq'ppa,Pa.9-14½ga.J5	149§
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	146†
Duluth,Minn. A7	146†
Fairfield,Ala. T2	146†
Houston,Tex. S5	154†
Johnstown,Pa. (43) B2	149
Joliet,Ill. A7	146†
KansasCity,Mo. S5	158†
Kokomo,Ind. C16	148†
Minnequa,Colo C10	154**
Monessen,Pa. 9 ga. P17	151
Pittsburg,Calif. C11	169†
Rankin,Pa. A7	146†
So.Chicago,Ill, R2	146**
Sterling,Ill.(1) N15	149

† Based on 5c zinc; *11c zinc; § 10c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala, R2	155
Atlanta A11	157
Bartonville,Ill. K4	157
Crawfordsville,Ind, M8	157
Donora,Pa. A7	155
Duluth,Minn. A7	155
Fairfield,Ala. T2	155
Joliet,Ill. A7	155
Houston S5	163
KansasCity,Mo. S5	167
Kokomo,Ind. C16	157
Minnequa,Colo. C10	160
Pittsburg,Calif. C11	179
So.Chicago,Ill. R2	155
So.SanFran.,Calif. C10	179
SparrowsPoint,Md. B2	157
Sterling,Ill.(1) N15	155

WIRE, Barbed

	Col.
Alabama,City,Ala. R2	159**
Aliquippa J5	156§
Atlanta A11	164
Bartonville,Ill. K4	164
Crawfordsville,Ind. M8	164
Donora,Pa. A7	159†
Duluth,Minn. A7	159†
Fairfield,Ala. T2	159†
Houston,Tex. S5	167†
Johnstown,Pa. B2	162*
Joliet,Ill. A7	159†
KansasCity,Mo. S5	171†
Kokomo,Ind. C16	161†
Minnequa,Colo. C10	165**
Monessen,Pa. P7	163
Pittsburg,Calif. C11	179†
Rankin,Pa. A7	159†
So.Chicago,Ill. R2	159**
S.SanFrancisco C10	179**
SparrowsPoint,Md. B2	164*
Sterling,Ill.(1) N15	162

† Based on 5c zinc; * 11c zinc; § 10c zinc; **Subject to zinc equalization extras.

WIRE (16 gage)

	An'ld Stone	Galv. Stone
Ala.City R2	13.15	14.70**
Aliquippa J5	12.50	14.30§
Bartonville K4	13.25	15.10
Buffalo W12	13.15	....
Cleveland A7	13.15	....
CrawfordsvilleM8	13.25	15.10
Fostoria,O. S1	13.25	14.80†
Johnstown B2	13.15	15.00*
Kokomo C16	12.60	14.15†
Minnequa C10	13.40	15.10**
Palmer,Mas.W12	13.15	14.70*
Pitts.,Calif. C11	13.50	15.05†
So.Chicago R2	13.15	14.70
SparrowsPt. B2	13.25	15.10*
Sterling(1) N15	13.15	15.00
Waukegan A7	13.15	14.70†
Worcester A7	13.45	....

* Based on 11c zinc; † 5c zinc; § 10c zinc; ** Subject to zinc equalization extras.

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	137
Atlanta A11	139
Bartonville,Ill. K4	139
Chicago,Ill. W13	137
Cleveland A9	142
Crawfordsville,Ind. M8	139
Donora,Pa. A7	137
Duluth,Minn. A7	137
Fairfield,Ala. T2	137
Galveston,Tex. D7	139
Houston,Tex. S5	145
Johnstown,Pa. B2	137
Joliet,Ill. A7	137
KansasCity,Mo. S5	149
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	156
Rankin,Pa. A7	137
So.Chicago,Ill. R2	137
SparrowsPt.,Md. B2	139
Sterling,Ill.(1) N15	137
Worcester,Mass. A7	143

NAILS, CUT (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$8.30
Wheeling,W.Va. W10	8.30

STAPLES, Polished Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	138
Aliquippa,Pa. J5	138
Atlanta A11	140
Bartonville,Ill. K4	140
Crawfordsville,Ind. M8	140
Donora,Pa. A7	138
Duluth,Minn. A7	138
Fairfield,Ala. T2	138
Johnstown,Pa. B2	138
Joliet,Ill. A7	138
Kokomo,Ind. C16	140
Minnequa,Colo. C10	143
Monessen,Pa. P7	138
Pittsburg,Calif. C11	157
Rankin,Pa. A7	138
So.Chicago,Ill. R2	138
SparrowsPt.Md. B2	140
Sterling,Ill.(1) N15	138
Worcester,Mass. A7	144

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2, I-2	150
Duluth,Minn. A7	150
Franklin,Pa. F5	150
Johnstown,Pa. B2	145
Marion,O. P11	145
Minnequa,Colo. C10	155
Moline,Ill. R2	155
So.Chicago,Ill. R2	150
Tonawanda,N.Y. B12	150
Williamsport,Pa. S19	150

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	4
$\frac{9}{16}$-in. & ⅝-in.	5
¾-in. and larger	3
Longer than 6 in.:	
All diameters	+4
Lag bolts, all diams.:	
6 in. and shorter	12
Over 6 in. long	8
Ribbed Necked Carriage	5
Blank	25
Plow	25
Step, Elevator, Tap and Sleigh Shoes	12
Tire Bolts	List
Boiler & Fitting-Up Bolts	23

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	58
H.P., Hex, regular & heavy:	
⅝" and smaller	58
⅞" to 1⅛", inclusive.	60
1¼" to 1½", inclusive	62
1⅝" and larger	58
C.P. Hex regular & heavy:	
All sizes	58
Hot Galv. Nuts (all types):	
⅝" to 1½", inclusive.	40
⅞" to 1½", inclusive.	43
Finished Hex Nuts:	
New standard, all sizes	58
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	58

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam. & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	47.5—10
Plated finishes	30—10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	38
¾-in. through 1 in.	22
Longer than 6 in.:	
⅝-in. and smaller	20
¾-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.25
$\frac{7}{16}$-in. under..List less 37%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.59	19.00
1¼	13	....	23.21	18.77
1½	13	21.40	25.65	20.75
1¾	13	25.28	30.31	24.52
2	13	28.33	33.97	27.48
2⅛	13	31.91	38.26	30.95
2¼	12	34.63	41.52	33.59
2½	12	38.15	45.74	37.00
2¾	12	41.31	49.53	40.07
3	12	44.05	52.82	42.72

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	Std. Tee Rails All No. 2	Std. Tee Rails 60 lb Under
Bessemer,Pa. U5	4.45	4.35	4.40	5.35
Ensley,Ala. T2	4.45	4.35	....	5.35
Fairfield,Ala. T2	....	....	....	5.35
Gary,Ind. U5	4.45	4.35	4.40	....
Huntington,W.Va. W7	....	....	....	5.35
IndianaHarbor,Ind. I-2	4.45	4.35	4.40	....
Johnstown,Pa. B2	....	....	...	(16)5.35
Lackawanna,N.Y. B2	4.45	4.35	....	5.35
Minnequa,Colo. C10	4.45	4.35	....	5.85
Steelton,Pa. B2	4.45	4.35	....	5.35
Williamsport,Pa. S19	....	....	....	5.35

TIE PLATES

Fairfield,Ala. T2	5.275
Gary,Ind. U5	5.275
Ind.Harbor,Ind. I-2	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Seattle B3	5.425
Steelton,Pa. B2	5.275
Torrance,Calif. C11	5.425

TRACK BOLTS (20) Treated

Cleveland R2	11.50
KansasCity,Mo. S5	11.50
Lebanon,Pa. B2	11.50
Minnequa,Colo. C10	11.50
Pittsburgh O3, P14	11.50
Seattle,Wash. B3	12.00

AXLES

Ind.Harbor,Ind. S13	6.75
Johnstown,Pa. B2	6.75

JOINT BARS

Bessemer,Pa. U5	5.425
Fairfield,Ala. T2	5.425
Ind.Harbor,Ind. I-2	5.425
Joliet,Ill. U5	5.425
Lackawanna,N.Y. B2	5.425
Minnequa,Colo. C10	5.425
Steelton,Pa. B2	5.425

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.30
Ind.Harbor,Ind. I-2, Y1	7.30
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.30
Minnequa,Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B3	7.80
So.Chicago,Ill. R2	7.30
Struthers,O. Y1	7.30
Youngstown R2	7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron:	Cents
98+% Fe, annealed	*15.25*
Unannealed	
Minus 100 mesh	*11.75*
Minus 35 mesh	*9.25*
Minus 20 mesh	*9.00*
Swedish, c.i.f. N.Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N. J., in bags	*9.50*
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	22.00
Annealed, 99.5% Fe.	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Atomized, 500 lb drums, frgt. allowed:	
Carlots	30.00
Ton lots	32.00
Antimony, 500 lb lots	32.00*
Brass, ¼-ton lots	29.75-37.75†
Bronze, ¼-ton lots	31.00-39.00†
Copper:	
Electrolytic	*13.75**
Reduced	*13.75**
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	89.50
Nickel-Silver, ¼-ton lots	44.25§
Nickel-Silver, ¼-ton lots	47.00**
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	91.00
Tin	14.50*
Zinc, ¼-ton lots	17.25-31.00‡
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.95
Less than 1000 lb	5.10
Chromium electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

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(1) Chicago base.
(2) Angles, flat, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1 7/16"; 1 7/16" to 1 15/16" 4.78c; 1 15/16" to 7 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.35c H.S.-L.A.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & heavier; 60" & narrower.
(38) 14 gage & lighter.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill zone or within switching limits, 5.10c.
(43) 9-14½ gage.
(48) 6-7 gage.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Ambridge, Pa. N2	13.5	...	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Youngstown Y1	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5 (*)	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Alton, Ill. L1	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Benwood, W. Va. W10	24	+4.5	15.25	+10.25	7.25	+17.25	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Butler, Pa. F6	25	+3.5	17	+8.5	9.5	+15	....	..	....	...	....	..	....	....
Etna, Pa. N2	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Fairless, Pa. N3	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Fontana, Calif. K1	...	...	....	....	....	....	10.75	+6.5	13.75	+2.5	16.25	1	18.75	2.25
Ind. Harbor Y1	...	...	....	....	....	....	22.75	5.5	25.75	9.5	28.25	13	30.75	14.25
Lorain, O. N3	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sharon, Pa. S4	25	+1.5	17	+6.5	9.5	+12	....	..	....	...	....	..	....	....
Sharon, Pa. M6	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Youngstown Y1	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.75
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	....	...	....	...
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	8.75	25.5	8.75
Fairless, Pa. N3	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Fontana, Calif. K1	19.25	3.25	19.75	3.75	21.25	4	21.25	4	12.5	+5.25	12.5	+5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	2.45	6.75	24.5	6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sharon, Pa. M6	13.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Youngstown Y1	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75

Galvanized pipe discounts based on current price of zinc (11.50c, East St. Louis).

Stainless Steel

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	41.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	41.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	44.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	43.75	43.75
304L	....	....	*36.00*	*41.25*	*39.50*	*42.50*	*45.00*	*48.75*	*48.75*
305	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	48.00	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	62.00	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	62.75	67.50	69.00	72.25	72.25
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	53.25	55.60	59.00	62.75	62.75
316L	....	....	52.50	....	58.25	61.00	64.25	67.75	67.75
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	77.00
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	80.25	80.25
321	22.75	29.50	35.25	40.75	41.00	42.00	46.00	50.50	50.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	59.25	59.25
348	....	....	48.25	....	....	57.50	62.25	70.50	70.50
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	34.25	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	35.25	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	33.75	38.25	50.25	39.50	40.75	50.75	59.75
501	....	....	14.00	14.50	21.25	16.00	18.25	29.00	29.00
502	....	....	15.25	16.00	22.25	17.00	20.00	30.00	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co., Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co., Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

Cladding Stainless	Plates Carbon Base 10%	Plates Carbon Base 20%	Sheets Carbon Base 20%
302	....	31.00	31.00
304	27.60–28.10	32.50–33.20	32.50
310	36.50	41.00	....
316	32.60–33.10	37.70–42.75	42.75
318	37.00–37.50	42.20–42.70	....
321	29.36–29.80	34.40–37.00	37.00
347	30.40–30.90	35.50–40.50	40.50
405	23.40–23.90	30.60–31.10	....
410	22.90–23.40	30.10–30.60	....
430	23.40	30.60	....
Inconel	46.90	61.90	....
Nickel	38.30	51.70	....
Monel	39.70	52.66	....
Copper*	....	....	46.00

	Strip, Carbon Base			
	Cold-Rolled		Hot-Rolled	
	10%	Both Sides	10%	Both Sides
Copper*	28.85	35.85	25.00	32.25

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* Deoxidized. Production points: Stainless-clad sheets. New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; Copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.030
18.25	4.25	1	4.75	...	2.245-2.415
18	4	2	9	...	2.615
18	4	2	....	...	1.705
18	4	1	....	...	1.540
14	4	2	5	...	2.185
13.75	3.75	2	5	...	2.185
13.5	4	3.	....	...	1.805
9	3.5	..	....	...	1.115
6	4	2	....	5	1.045
6	4	3	....	6	1.290
1.5	4	1	....	8.5	0.900

Tool Steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Birmingham R2	52.38	52.88	....	....
Birmingham U5	....	52.88	56.50†	....
Gadsden,Ala. R2	52.38	52.88	....	....
Woodward,Ala. W15	52.38	52.88	56.50†	....
Cincinnati, del.	....	60.43	....	....
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	....
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No.Tonawanda,N.Y. T9	....	56.50	57.00	57.50
Boston, del.	66.65	67.15	67.65	....
Rochester,N.Y., del.	59.02	59.52	60.02	....
Syracuse,N.Y., del.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Chicago R2	56.00	....	56.50	....
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, del.	58.17	58.67	58.67	59.17
Muskegon,Mich., del.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron,O., del. from Cleve.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
NewYork, del.	....	62.28	62.78	....
Newark, del.	61.02	61.52	62.02	62.52
Birdsboro,Pa. B10	58.00	58.50	....	....
Chester,Pa. C31	48.00	48.50	49.00	....
Philadelphia, del.	49.66	50.16	50.66	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Troy,N.Y. R2	58.00	58.50	59.00	....
Pittsburgh District				
NevilleIsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Ambridge, Aliquippa, del.	57.37	57.87	57.87	58.37
McKeesRocks, del.	57.04	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, del.	57.66	58.16	58.16	58.66
Verona,Trafford, del.	58.19	58.69	58.69	59.19
Brackenridge, del.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....
Monessen,Pa. P7	56.00	....	....	....

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., del.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	60.50	61.00	61.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T2	....	52.50*	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, del.	61.76	62.26	....	....

* Low phos. southern grade. † Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.00 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$65.00
Buffalo H1	66.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$80.50
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	85.00
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	88.00
Wenatchee,Wash. OH & Fdry, freight allowed K2	85.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate A7	$61.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, del.	67.55
Troy,N.Y. R2	64.00

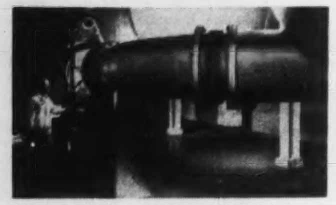
Warehouse Steel Products

Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Birmingham and St. Paul, 15 cents; New York and Boston, 10 cents; Buffalo, 25 cents on C.R. sheets, galv. sheets, C.F. and alloy bars and 20 cents on other commodities; Philadelphia, 10 cents, except 25 cents on alloy bars; Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	Stainless Type 302‡‡	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Baltimore	6.22	7.51	7.77	....	6.89	...	6.88	8.52[6]	12.04	6.92	6.57	7.96**
Birmingham	6.35	7.35	8.25[2]	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45
Boston	7.23	8.23	9.52	44.78[9]	7.47	...	7.20	8.60	12.45	7.49	7.37	8.50
Buffalo	6.35	7.40	8.79	....	6.70	...	6.50	7.85	12.15	6.72	6.65	7.90
Carnegie, Pa.	6.38	...	8.30	....	6.72	...	6.51	7.85	12.15	6.72	6.65	6.90
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.38	7.38	8.30	45.55	6.62	...	6.51	7.50	11.90	6.69	6.52	7.64
Cincinnati	6.49	7.37	8.25	45.80	6.86	...	6.75	7.80	12.15	6.86	6.81	7.89
Cleveland	6.38	7.38	8.45	45.66	6.72	...	6.57	7.60	11.96	7.02	6.69	7.81
Detroit	6.57	7.57	8.58	43.50	6.90	7.36	6.79	7.79	12.10	7.16	6.80	7.83
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45[4]	....	6.69	6.52	7.64
Houston	7.35	7.80	9.93	....	7.70	9.30	7.70	9.50	....	7.35	7.35	8.75
Los Angeles	7.40	9.25	9.80	50.15	7.75	11.75	7.35	10.05	13.20	7.55	7.35	9.45
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.69	11.99	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.85	....	6.81	6.87	...
New York	6.97	7.91	8.79	44.45	7.56	...	7.37	8.73[6]	12.28	7.38	7.27	8.68
Norfolk, Va.	7.00	...	...	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.44	8.23	41.98[9]	6.96	8.80	6.74	8.36[6]	12.11	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	45.50	6.72	...	6.51	7.85	11.90	6.69	6.52	7.64
Portland, Oreg.	7.60	8.75	9.70	48.50	7.85	...	7.55	10.95	14.00	7.50	7.45	9.35
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.59	43.89	6.91	...	6.80	7.89	12.19	7.09	6.81	7.93
St. Paul	7.03	8.03	8.96	....	7.28	...	7.16	8.26	....	7.12	7.19	8.30
San Francisco	7.55	8.95	9.35	48.15	7.80	...	7.35	10.05	13.20	7.50	7.40	9.45
Seattle	8.10	9.80	10.15	50.50	8.20	...	7.80	10.95	13.65	7.75	7.80	9.60
Spokane	8.35	9.65[7]	10.05	....	7.80	...	7.80	10.85[8]	14.40	7.45	7.55	9.60
Washington	6.70	7.99	7.97	....	7.37	...	7.38	9.09	....	7.31	7.05	8.16

*Prices do not include gage extras; †prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extras excluded); ‡includes 35-cent special bar quality extra; §as rolled; **¼-in. and heavier; ††as annealed; ‡‡prices include $2 for crating; Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb; stainless sheets, 8000 lb except in New York and Boston where base is 10,000 lb; hot-rolled products in Cincinnati, 2000 to 4999 lb; [2]—500 to 9999 lb; [4]—4000 lb and over; [5]—1000 to 1999 lbs; [6]—1000 lb and over; [7]—1500 lb to 3999; [8]—under ½ in.; [9]—f.o.b. local delivery in lots of 10,000 lb and over.

HEAT RESISTANCE: ENDURO can handle gases from full scale thermal jet engines, reciprocating engines, turbines, burners and other equipment tested in simulated high altitude conditions.



CORROSION-RESISTANCE: This is one of ENDURO's best known qualities. Installations of various types over the past thirty years offer visible proof that ENDURO stands up under some of the toughest corrosive conditions.

CLEANABILITY: ENDURO's high resistance to radioactive matter makes it a choice for equipment where this material is used. The answer is its smooth finish which offers little surface to which particles can cling.

U.S. AIR FORCE
6679
FY-679

Here's how they're using some of Enduro's properties

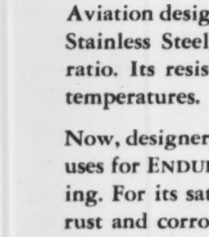
Aviation design engineers have long used ENDURO Stainless Steel for its high strength-to-weight ratio. Its resistance to high as well as sub-zero temperatures.

Now, designers in other fields are discovering new uses for ENDURO. For its remarkable ease of cleaning. For its satin luster. For its high resistance to rust and corrosion.

Management likes ENDURO, too. It can be fabricated profitably. And it gives extra sales features to products which might otherwise be lost in the shuffle.

No other commercial metal offers such a unique combination of physical and chemical properties as ENDURO Stainless Steel, the metal of 10,000 uses. Republic will be glad to help you use it . . . profitably. Write to:

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, New York



FREE

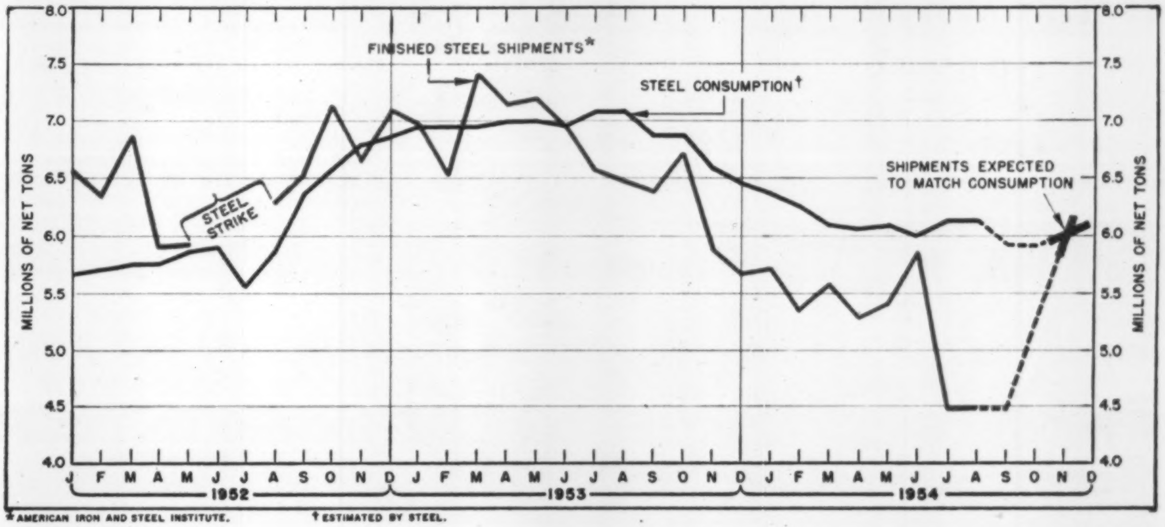
This 36-page booklet gives properties, fabricating and joining methods, care and finishing of ENDURO Stainless Steels. Write for it. Ask for ADV. 561.

REPUBLIC STEEL

REPUBLIC ENDURO STAINLESS STEEL

Other Republic Products include Carbon and Alloy Steels — Titanium — Pipe, Sheets, Strip, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

Keep Your Eye on the X: It Could Mean a Squeeze in Steel



*AMERICAN IRON AND STEEL INSTITUTE. †ESTIMATED BY STEEL.

BE ON GUARD against a steel supply squeeze in late November and early December. By then inventories should be reduced enough to put buyers back into the market for steel, at least for current consumption rates. If buyers make a run on the market, you may find it'll take longer to get delivery than it does now. If your inventories are low or unbalanced, you may be caught short.

The period to watch is marked by the "X" at the right side of the chart. It is formed by projecting two trend lines—finished steel consumption and mill shipments of finished steel.

By late November and early December, resumed buying is expected to push mill shipments up to the level of consumption. Shipments have lagged behind consumption since June, 1953. From July, 1953, to August, 1954, both inclusive, consumers reduced steel inventories 9.9 million net tons, STEEL estimates. At this year's rate, that is equivalent to about two months' shipments.

It's commonly estimated that consumers have reduced their steel inventories to a 30-day supply. This makes it appear there was a three-month supply, or about 15 million tons, of steel in inventory when reduction began in July, 1953. That seems probable. In the two-month steel strike in 1952, consumers continued to operate with few interruptions. They had enough steel to carry them through the strike, and then some.

Length of time an inventory will last depends on the rate of consumption. With business off somewhat, inventory reduction took longer than if business had been brisk.

Studies of steel consumption and mill shipments show that inventory building began in September, 1950, shortly after the Korean war started, and continued with few interruptions until June, 1953.

In its chart above, STEEL computed the consumption line on the Federal Reserve Board's index of metal fabricating. The mill shipments line comes from figures compiled by the American Iron & Steel Institute.

Indicative of the emphasis that has been put upon inventory reduction, General Motors Corp. is reported determined to keep its inventories down to a 21-day supply. Even though a company aims to keep low inventories, once it gets its inventories down, it will have to buy at the rate of its consumption. If consumption remains fairly high, demand will be fairly high.

While most consumers seemed to be aiming for a 30-day supply, there are reports now that some are inclined to raise them to 45 days. If this occurs along with the resumption of buying for current use, there could be a supply squeeze—even if it's only temporary.

Republic Abandons County Delivered Pricing System

Republic Steel Corp. abandoned its county delivered pricing system today. It was inaugurated last Dec. 15.

The county delivered pricing system was applied to only some of Republic's steel products—structurals, carbon plates, high strength plates, hot-rolled carbon bars, hot-rolled alloy bars, hot-rolled alloy bar shapes, cold-finished carbon bars, cold-finished alloy bars and reinforcing bars.

No other major steel producer adopted the system. Other companies retained the mill pricing basis. This made two pricing systems in the steel industry, and Republic explains that some of its customers felt it necessary to set up separate accounting procedures to service Republic invoices. "We have no desire to inconvenience our customers in this respect, even though we feel there are distinct advantages in quoting on a delivered price basis," Republic officials say.

Now all Republic's steel mill products will be priced the old way: Prices quoted will be those at the mill, with the customer paying the freight. Republic will continue to remain competitive by absorbing freight where necessary. It says: "To destinations where delivered costs from Republic's mills are not competitive, we will continue our policy of negotiating freight allowances in individual instances."

When Republic instituted the county delivered pricing system last December, it explained that with steel readily available, customers were shopping around for the lowest de-

Here's why it PAYS to use . . .

GEARS made by FAIRFIELD

MASS PRODUCTION ECONOMY—Large or small, you get the benefits of high production rates and big volume output at FAIRFIELD—the place where fine gears are produced to meet your specifications EFFICIENTLY, ECONOMICALLY!

QUALITY PLUS—There is no finer recommendation for the quality of the product you sell than to be able to say that it is "EQUIPPED WITH FAIRFIELD GEARS!"

DEPENDABLE SOURCE OF SUPPLY—Supplier of precision-made, automotive type gears for over thirty years to leading builders of construction, agricultural, industrial, marine, and automotive equipment.

COMPLETE PRODUCTION FACILITIES—Unexcelled facilities in a new and ultramodern plant for producing Spur, Herringbone, Spiral Bevel, Straight Bevel, Hypoid, Zerol, Worms and Worm Gears, Splined Shafts, and Differentials to your specifications.

ENGINEERING SERVICE—Fairfield engineers are qualified to make expert recommendations on your gear production requirements. Take advantage of the service offered. *Your inquiry will receive prompt attention.*

FAIRFIELD
MANUFACTURING CO.
2313 So. Concord Road
LAFAYETTE,
INDIANA

for FINE GEARS

livered price on steel. They wanted to know the price delivered to them. The county delivered system was designed to show them that information immediately. Often it had been necessary for the salesman in the field to check with a traffic expert in the home office, sometimes taking several days.

Republic printed and distributed tables showing delivered prices in all the counties it could serve in the United States.

Many customers, particularly big ones with accounting departments equipped to check invoices using most any method of pricing, liked the new system. Others, mainly small firms with limited accounting departments, objected to dealing with two methods of pricing.

Tin Plate . . .

Tin Plate Prices, Page 142

Minor changes in extras and deductions on tin mill products, effective Oct. 1, are announced by U. S. Steel Corp., Pittsburgh. Revised cards supercede those in effect since July 26, 1952.

Higher tin mill product prices, announced several weeks ago, became effective Oct. 1. Increases of 10 cents per 100 lb are in effect on tin plate, black plate, special coated manufacturing ternes and holloware enameling black plate.

Sheets, Strip . . .

Sheet Prices, Page 141

Sheetmakers are booking fourth quarter orders in swelling volume. Deliveries on cold-rolled sheets and strip are steadily extending—to a large degree in response to better automotive demand. Expectations are brisk orders will continue into first quarter.

Pittsburgh producers report users of cold-rolled sheets are seeking to build inventories to 45-days. Mirroring better demand, Pittsburgh Steel Co.'s new cold-rolled sheet mill at Allenport, Pa. has started round-the-clock operations for the first time since it started rolling in April.

Deliveries on cold-rolled sheets and strip extend to 10 weeks in the Chicago market, the longest reported this year.

Generally, the current improvement stems from quickening automotive demand. Pickup in other directions is less noticeable.

Except for minor adjustments, prices are firm. Last week U. S. Steel Corp. reduced base prices on culvert sheets, but the reductions were just about offset by upward revisions in the extras applying. Republic Steel

(*Please turn to page* 152)

Diamonds are a tool's best friend

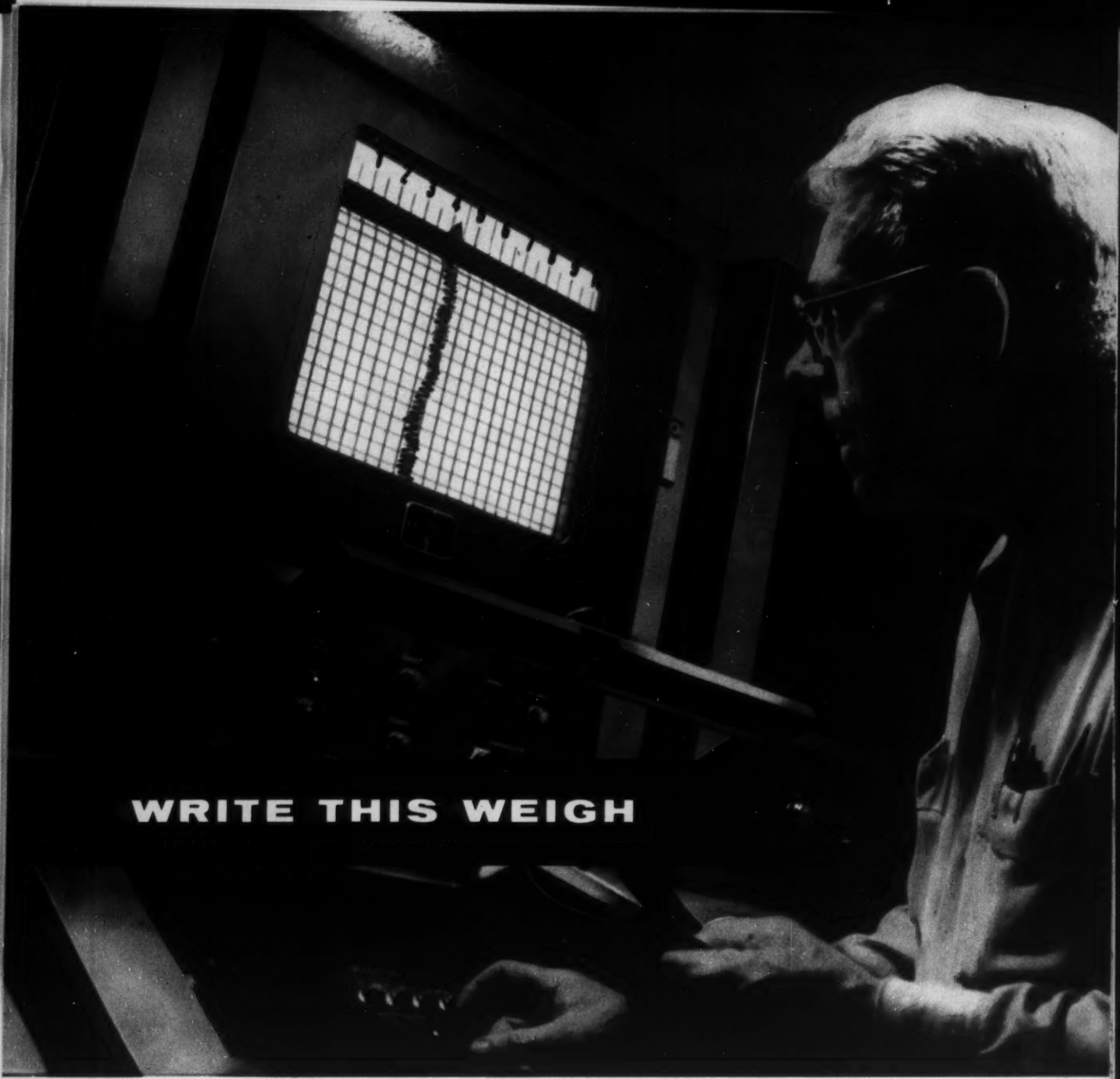
Hard cemented carbide cutting tools demand keen edges, extra-fine finishes, close tolerances...and you'll get all this with Diamond Wheels by CARBORUNDUM. They cut cool—increase tool life...hold size and profile—give the sharpest edges—where sharpness is important...reduce grinding time—often eliminate intermediate operations...save you money—one wheel grinds thousands of tools. For roughing dull or broken tools...use GREEN-GRIT Silicon Carbide Wheels by CARBORUNDUM. For expert counsel, fast service for every tool grinding operation, call your CARBORUNDUM Distributor or Salesman.

Through product quality and application "know-how"

CARBORUNDUM

REGISTERED TRADE MARK

continually puts more sense in your abrasive dollar



This Beta-Ray Gauge supervises the scientific precision you get in all Coated Abrasive Products by CARBORUNDUM. With its piercing nuclear "eyes" it measures and records the weight, or thickness of the backing, bond and abrasive grain as they are combined on giant roll-making machines. The result: dependably uniform coated abrasive products, unvarying in quality from one order to the next . . . to give you consistently dependable performance on every sanding and finishing job. This is but one of many scientific quality checks made by CARBORUNDUM on all coated abrasive products, to give *you* fast, efficient economical sanding and finishing. Your CARBORUNDUM Distributor or Salesman is the man to call.

Through product quality and application "know-how"

CARBORUNDUM

REGISTERED TRADE MARK

continually puts more sense in your abrasive dollar

THEY LOOK ALIKE

Cast rail and fabricated base assembly

One-piece Gray Iron rail

...but compare production costs!

GRAY IRON CHARACTERISTICS INCLUDE:

- Castability
- Strength
- Rigidity
- Low Notch Sensitivity
- Wear Resistance
- Heat Resistance
- Corrosion Resistance
- Durability
- Vibration Absorption
- Machinability

One-piece Gray Iron casting cuts machining and assembly steps

Still another manufacturer has found that one-piece Gray Iron castings lower production costs and improve product performance.

Shown above are two types of main rails along which an oxyacetylene shape cutting machine travels. One is a two-piece assembly . . . the other is all Gray Iron.

By redesigning as a one-piece Gray Iron casting, this manufacturer eliminated two machining operations and one assembly operation formerly required to make the fabricated rail. Because of the inherent dimensional stability and rigidity of Gray Iron, cutting accuracy of the machine is held to .015" over the 12' of travel.

Have you taken a good look at the cost-saving and improved performance possibilities of redesigning your fabricated parts for Gray Iron casting? Why not let us help you—write for technical information on the many advantages of the Gray Iron casting process.

MAKE IT *BETTER* WITH GRAY IRON

75% of all cast metal products are Gray Iron

GRAY IRON FOUNDERS' SOCIETY, INC.

NATIONAL CITY-E. 6th BLDG., CLEVELAND 14, OHIO

"FORGED STEEL CAN DO SO MANY JOBS SO WELL"

Flats • Rounds • Squares • Hexagons

Special Shapes & Prototype Forgings

FURNISHED IN

Aircraft, Alloy, Stainless, & Carbon Steels

FLATS

Thick	Wide	Long
¼"	¾"-4"	8 ft.
⅜"	½"-6"	10 ft.
½"	⅝"-6"	10 ft.
⅝"-⅞"	¾"-10"	12 ft.
1"-1¼"	1⅛"-10"	12 ft.
1⅜"-1¾"	1½"-10"	16 ft.
1⅞"-3"	2"-12"	16 ft.
3⅛"-5"	3¼"-16"	16 ft.

ROUNDS — ½"-12"
SQUARES — ½"-12"
HEXAGONS — ½"-5"

Max. Bar Wgt. 5000 lbs.
Max. Bar Lgt. 20 ft.

Ends Cold Sawed

All steel smooth forged to standard forging tolerances ★ Complete facilities in our own plant for rough turning and rough boring ★ Heat treating facilities for bars max. length 20 ft.

McINNES
STEEL COMPANY
SINCE 1895
MILL: CORRY, PENNSYLVANIA
Offices in all principal cities

(*Concluded from page 148*)

Corp.'s revised extra card on hot-rolled sheets, effective Sept. 28, includes four pages devoted to weight, thickness, diameter, camber, width, length and other tolerances. These effect some slight changes in ordering requirements, but in the main are included to conform with the American Iron & Steel Institute's revised product manual now being issued.

Steel Bars . . .

Bar Prices, Page 140

Some slight quickening in demand for commercial bars is noted, but, over-all, volume continues disappointing. Shipments are available within two to three weeks on most sizes, and, as a result, buyers are in no hurry to order for inventory though their stocks are low.

While there are evidences of a stepping up in defense work, this has not been reflected to any marked degree in bars. Eastern mills are offering first rollings on virtually all sizes and shapes. There is a little more activity in alloy bars in this area, a development that encourages some optimism since such activity often proves a forerunner of better business in carbon grades.

Structural Shapes . . .

Structural Shape Prices, Page 140

Increasing diversity of building construction is indicated in current demand for structurals despite the dominance of bridge work. Recent contracts in the East, for example, include industrial buildings, schools, apartments, office structures, stores and institutional buildings.

Much of this work involves small tonnage (100 to 500), but jobs total sizable volume and are serving to provide smaller fabricating shops with numerous bidding opportunities.

In general, demand continues steady. Steel is in adequate supply with the possible exception of wide flange sections.

Canadian Steel Prices Up

Canadian steelmakers have advanced prices on various products to partially offset a recent wage increase. Cold-rolled steel is up $3 and hot-rolled $2 per ton, but the higher prices do not take up the full impact of the wage hike.

Under the new price schedule, per 100-lb, 13 gage and heavier hot-rolled bars moved up from $4.25 to $4.35; cold-rolled steel from $5.35 to $5.50; plates from $4.60 to $4.70; sheets from $5.35 to $5.50. Extras, which are the same as those applied by U. S. mills, are unchanged.

WHEELING STEEL CORPORATION
WHEELING, WEST VIRGINIA

WHEELING

SOFTITE

GALVANIZED SHEETS

DUCTILE, TIGHT-COATED — IN GAUGES NO. 18 TO 30

WHEELING STEEL

TOLEDO STAMPINGS

Let us make your stamping problems our problems. Our Engineering Department has had many years of experience in development work and our production facilities include not only a modern press department, but facilities for copper hydrogen brazing and other types of welding and assembly-ing work. We solicit your prints and inquiries.

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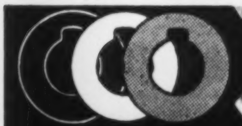
Detroit Office: 14225 Schaefer Road, Detroit 27, Michigan
Chicago Office: 333 North Michigan Ave., Chicago, Ill.

KARDONG FOUR-WAY BENDER
For Concrete Reinforcing Bars

Model D-2

The Model D-2 Kardong Bender is a Four Direction Horizontal Bender. With this bender it is not necessary to turn bars over to make reverse or second bends on beam bars. The Model D-2 is made in two sizes, Model D-2 Standard 6-inch, which will bend bars around collars 2-inch to 6-inch, and Model D-2 Special 8-inch, which will bend bars around collars 2-inch to 8-inch. Capacity of both models, 1¼-inch Square Bars. The Model D-2 is a production bender for reinforcing steel fabricating shop. Ask for catalog of our complete line of reinforcing bar benders.

KARDONG BROTHERS, INC.
MINNEAPOLIS 13, MINN.



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ARTUS PLASTIC SLITTING MACHINE SHIMS

THE COLOR TELLS THE THICKNESS

ALWAYS RETAINS UNIFORMITY AND EVENNESS UNDER ALL NORMAL CONDITIONS

Save Time! Save Money!

INDUSTRIAL PRODUCTS SUPPLIERS 201 South Dean Street
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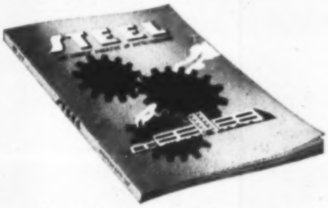
If your product belongs in Metalworking

. . . your advertising belongs in STEEL!



You advertise in STEEL to reach
ALL 4 buying influences . . .
management, production, engineering, purchasing.

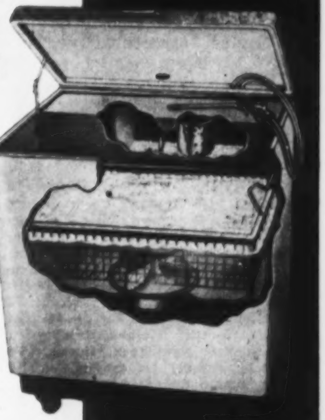
POWERFUL AGITATION
Cleans Parts **FASTER BETTER**

TURBO BLAST

CLEANING MACHINES

Impeller creates tremendous force to remove grease, oil, carbon, sludge, dirt. No limit to applications. Saves 1/3 to 1/2 on time and cost over other methods.

Model JR 20
(20 gallon capacity)
List price
$214.50
Less gun and basket
OTHER MODELS
UP TO 50,000 GALLON CAPACITY



STORM-VULCAN, INC.
2225 BURBANK DALLAS, TEXAS

SEND FOR INFORMATION

Please send me Turbo-Blast information.

Name__________
Firm__________
Address__________
City__________ Zone_____ State_____

Steel Import Prices

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast*
Deformed Bars, Intermediate, ASTM-A-305	$4.95	$4.95	$4.85	$5.23
Bar Size Angles	4.55	4.55	4.50	4.93
Structural Angles	4.55	4.55	4.50	4.93
I-Beams	4.40	4.40	4.35	4.73
Wide Flange Beams	4.80	4.80	4.80	5.05
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.50	5.50	5.45	5.78
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	26.80	27.00	26.80	27.60
Barbed Wire	6.05	6.05	6.05	6.23
Merchant Bars	4.95	4.95	4.85	5.33
Hot-Rolled Bands	5.15	5.15	5.10	5.43
Wire Rods, Thomas Commercial No. 5	5.10	5.17	5.15	5.42
Wire Rods, O-H, Cold Heading Quality No. 5	5.23	5.30	5.25	5.55
Bright Common Wire Nails	6.85	6.95	6.90	7.15

*Not including $2.20 per net ton customarily charged in most West Coast ports for wharfage and handling.

	Sizes OD			
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

Imported Steel Prices Slip

Prices on bar size angles, structural angles and I-beams from western continental European countries are off 10 cents per 100 lb at North and South Atlantic ports and 5 cents per 100 lb at Gulf Coast ports.

Merchant bar prices are off 5 cents per 100 lb at North and South Atlantic ports; 15 cents, Gulf Coast ports; no change on the West Coast.

Barbed wire prices, on the other hand, are up 5 cents per 82 lb net reel and Thomas commercial No. 5 wire rods, up 30 cents per 100 lb at East, South and West Coast ports. Wire rods, open hearth, cold heading quality No. 5, sheets and plates and furring channels are unchanged.

Despite the easing in prices on bar size angles, structural angles and I-beams, reflecting a little slowing up in demand on this side, deliveries are still well extended.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1550 tons, Eli Whitney Vocational School, Hamden, Conn., to New England Iron Works, Hamden; Giordano Construction Co., New Haven, Conn., general contractor.

1330 tons, additions and alterations, unit 6, American Gas & Electric Service Corp., Philo, O., to Grand Iron Works, Bronx, New York.

1083 tons, section, Horace Harding expressway, Queens, New York, through Tully & DiNapoli, general contractors, to the Mt. Vernon Bridge Co., Mt. Vernon, N. Y.

900 tons, department store, Miami, Fla., to Lehigh Structural Steel Co., Allentown, Pa.

770 tons, state bridge work, New Castle, Del., to Delaware Steel Fabricating Corp., Wilmington, Del.

640 tons, industrial heating plant, General Electric Realty Corp., Shelbyville, Ind., to the International Steel Co., Evansville, Ind.

625 tons, shop and laboratory buildings, Redstone Arsenal, Huntsville, Ala., to Decatur Iron & Steel Co., Decatur, Ala.; Forcum-Jones Co., Memphis, Tenn., general contractor.

620 tons, State Department of Health office building, Albany, N. Y., to Schacht Steel Construction Inc., New York.

610 tons, bridge, Erie Mining Co., Taconite Harbor, Minn., to Bethlehem Steel Co., Bethlehem, Pa.

470 tons, Warchauer Haym Salomon Home for the Aged, Brooklyn, N. Y., to Dreier Structural Steel Co. Inc., Long Island City, New York.

425 tons, Public School 59, Brooklyn, through Planet Construction Corp., to Dreier Structural Steel Co. Inc., Long Island City, New York.

420 tons, six-story office building, Hempstead, N. Y., through Glickman Realty Corp., to Grand Iron Works, Bronx, New York.

280 tons, recreation building, St. Johns Park, Brooklyn, N. Y., to Schacht Steel Construction Inc., New York.

260 tons, warehouse addition, American Radiator & Standard Sanitary Corp., Trenton, N. J., to Keystone Construction Co., Trenton.

179 tons, state bridge, Montour county, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

170 tons, 10-story apartment, East 37th St., between Lexington and Park Aves., New York, to Sherry & Gordon, Bronx, New York.

135 tons, addition, Dubois high school, 503 West 152nd street, New York, through Thomas J. Hughes Construction Co., general contractor, to Grand Iron Works, Bronx, New York.

135 tons, building, 5-A, Cross County Shopping Center, Westchester, N. Y., through the Sol Atlas Corp., to Simon Holland & Son Inc., Brooklyn, New York.

135 tons, two shops, Air Force base, Dover, Del., through Dean Construction Co., general contractor, to the Camden Iron Works, Camden, N. J.

125 tons, state bridge, Atlantic county, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

120 tons, Doctors Medical Arts building, Long Branch, N. J., through Charles V. Hembling & Sons, general contractor, to the Irvington Steel & Iron Works, Irvington, N. J.

115 tons, maintenance shop, air base, Dover, Del., to Belmont Iron Works, Eddystone, Pa.

115 tons, manufacturing building, Autoyre Co., Watertown, Conn., to Berlin Construction Co., Berlin, Conn.; E. & F. Construction Co., Bridgeport, Conn., general contractor.

110 tons, West Snyder high school, Beavertown, Pa., to Goetz Welding Co., Harrisburg, Pa.

110 tons, boiler supports, Combustion Engineering Inc., Anacortes, Wash., to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, three transmission towers and terminal structures, Consolidated Edison Co., Pleasantville, N. Y., through Cuzzi Bros. & Singer Inc., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

STRUCTURAL STEEL PENDING

12,785 tons, bridge superstructure, Route 200, project 3459, Greys Point, Lancaster-Middlesex, Va.; bids Oct. 11, Department of Highways, Richmond, Va.; also 275 tons of reinforcing in this opening, contract No. 2.

3000 tons, power plant, Glenlyn, Va., bids asked.

1687 tons, state turnpike bridges, Lehigh county, Pa.; comprising two projects of 1270 and 415 tons, respectively; Lane Construction Co., Meriden, Conn., low on general contract.

1075 tons, turnpike extension, Hudson county, N. J., bids Oct. 14.

915 tons, bridges, LaPorte county, Indiana toll road, contracts C-22 and C-23; bids Oct. 6 to Indianapolis.

853 tons, turnpike bridge work, Montgomery and Bucks counties, Pa., bids Oct. 7.

670 tons, turnpike bridge work, Lehigh county, Pa., bids Oct. 14.

642 tons, bridge, State Department of Highways, Lycoming county, Pa., bids Oct. 22.

573 tons, trestle construction, Garden state parkway, contract No. 173, section 11, Atlantic county, New Jersey, or an alternate comprising two options—pre-stressed concrete construction or pre-cast beams, weighing 168 lb. each; latter option, in addition to pre-stressed beams, also would require 216 tons of reinforcing steel; the former alternate in addition to taking 573 tons of shapes will also require 216 tons of reinforcing steel; in addition to the trestle work, 475 tons of reinforcing steel, 11,000 lineal feet of steel bearing piles and 8960 lineal feet of metal railing will be up for figuring. Bids will be closed by the New Jersey Highway Authority, Trenton, N. J., Oct. 14.

500 tons, plant building, DuPont interests, Montague, Mich.; bids closed Oct. 1.

372 tons, state bridge, Indiana county, Pa., bids Oct. 22.

150 tons, building, Sears, Roebuck & Co., Elizabeth, N. J.; bids closed Oct. 1.

130 tons, 150 ft I-beam bridge, Bedford, N. H.; bids in.

125 tons, including reinforcing bars, Mesa pump plant, Columbia Basin project; bids to Bureau of Reclamation, Ephrata, Wash., Oct. 19.

100 tons plus, multi-purpose hangar, Larson Air Base, Washington state; D. M. Drake Co. and George A. Fuller, Portland, Oreg., joint low at $497,000 to E. S. Engineer, Walla Walla, Wash.

REINFORCING BARS . . .

REINFORCING BARS PLACED

774 tons, bridge piers, Maine turnpike extension, South Portland-Falmouth, Me., equally divided between Bancroft & Martin Rolling Mills Co., South Portland, Me., and Truscon Steel Division, Republic Steel Corp., Boston; Gil Wyner Co. Inc., Malden, Mass., general contractor; McGarrahan Co., Boston, erection only, 2180 tons, fabricated structural steel.

530 tons, bridge piers, Maine turnpike extension, New Gloucester-Auburn, Me., to Truscon Steel Division, Republic Steel Corp., Boston; Consolidated Construction Co., North Attleboro, Mass., general contractor; Auguste Brassard, Central Falls, N. Y., erection only, 1475 tons, fabricated structural steel.

300 tons, hospital boiler house and facilities, Westover Air Force Base, Chicopee Falls, Mass., to Concrete Steel Co., Boston; John A. Volpe Construction Co., Malden, Mass., general contractor; 50 tons, structural steel, to West End Iron Works, Cambridge, Mass.

300 tons, bars and shapes, Northside junior high school, Norfolk, Va., to Hall-Hodges Co., Richmond, Va. (bars) and Barnum-Brums Iron Works, Norfolk (structurals); W. T. Gregory Construction Co., Norfolk, general contractor.

160 tons, Shell Oil Co., ocean dock, Anacortes, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle.

110 tons, Ft. Richardson, Alaska, warehouse, to Bethlehem Pacific Coast Steel Corp., Seattle.

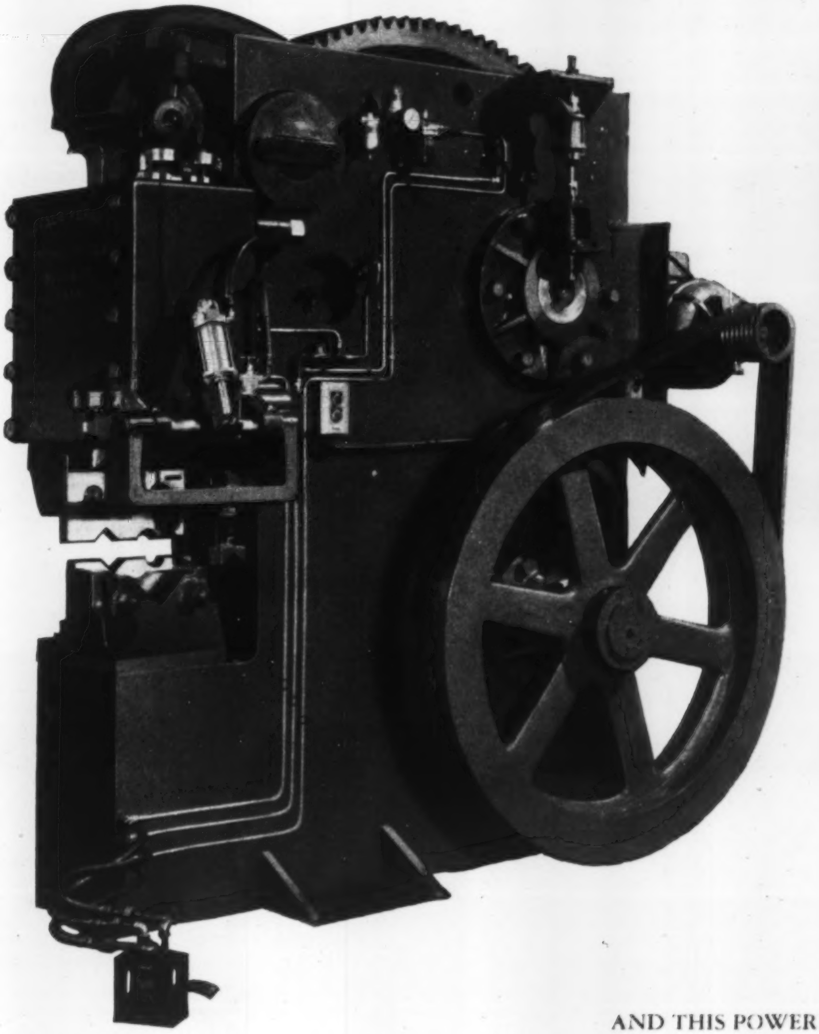
100 tons, municipal library, Hartford, Conn., to Scherer Steel Co., Hartford; Wadhams & May Co., Hartford, general contractor; 1300 tons, structurals, to Lehigh Structural Steel Co., Allentown, Pa.

100 tons, shop and laboratory buildings, Redstone Arsenal, Huntsville, Ala., to Virginia Steel Co., Birmingham, Ala.; Forcum-Jones Co., Memphis, Tenn., general contractor.

(*Please turn to page* 157)

250-TON SHEAR-POWER

FOR IMMEDIATE DELIVERY



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- **2¼-in. STROKE**
- **CLEAN, SQUARE CUTS**
- **POWER-DRIVEN LUBRICATION SYSTEM**

"Buffalo"

No. 51 MILL TYPE SHEAR

AND THIS POWERFUL SHEAR IS IN STOCK!

If you want more speed in shearing your heavy rounds, squares, or flats—if you want clean, accurate, uniform cuts for minimum wastage and better quality—if you want a machine with the rigidity and strength to take your most punishing runs—it's available to you NOW in this No. 51 Mill Type Shear. Write today for details. Immediate delivery.

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BUFFALO FORGE COMPANY

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How Centrifugally Cast Bushings solved quality problem for

S. MORGAN SMITH COMPANY

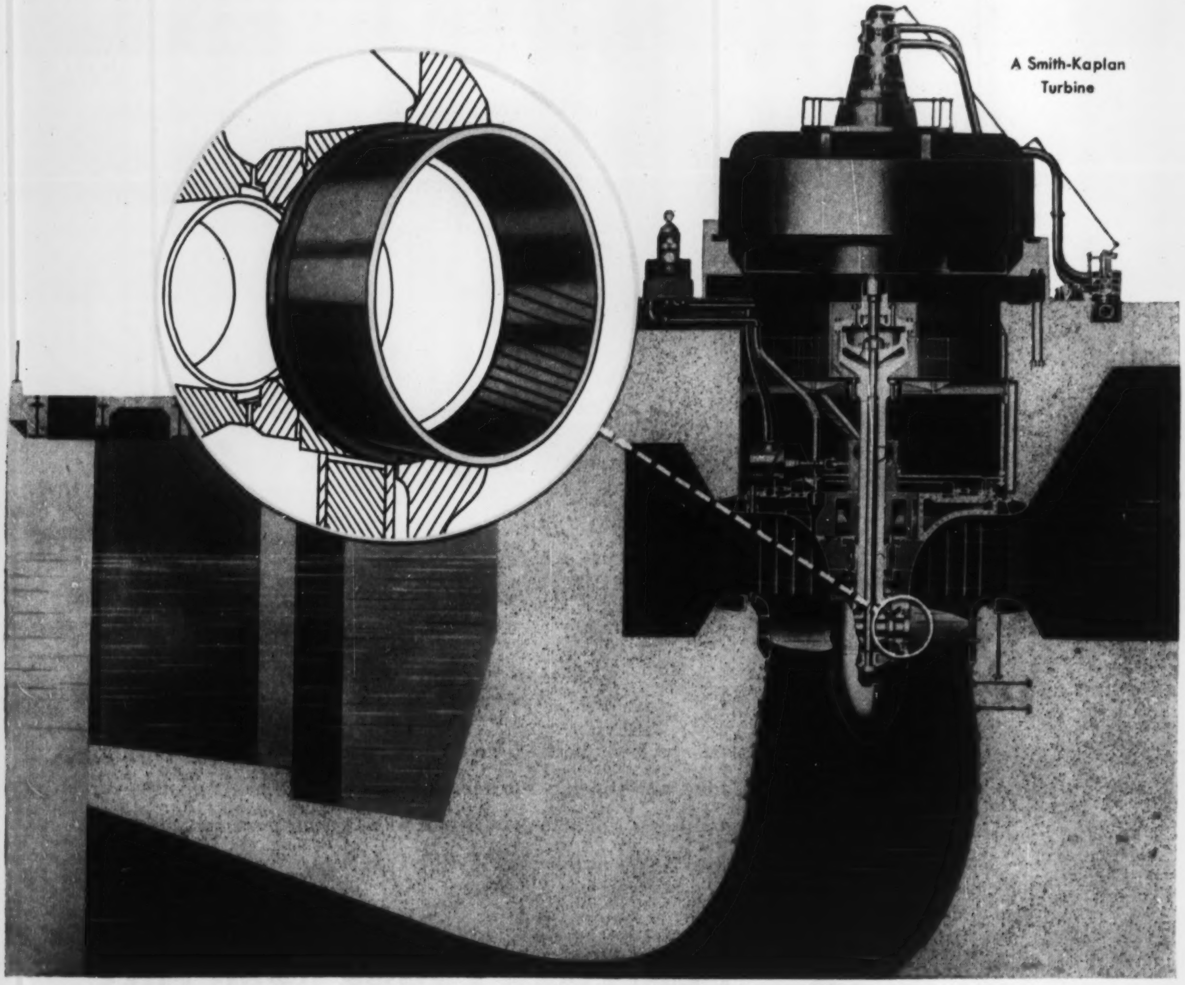
Original method of manufacture called for a bushing assembly of two centrifugal castings—basically a flange and cylinder—with flange shrunk-fit in place and pinned at eight points.

But under the self-imposed quality standard of the S. Morgan Smith Company, makers of giant hydroelectric turbines, continued research and development were indicated. It was felt that the assembly in question—a bronze bushing capable of seating and supporting a 21,000-pound propeller blade—could be improved if made as a single, centrifugally cast piece to minimize the danger of blowhole and shrinkage.

Pioneering was called for. Something that was thought impossible must be done.

***And it was done by National Bearing.* Research, engineering skill and a wealth of tough-problem experience were put to work. The result: A one-piece, centrifugally cast, bronze bushing capable of meeting the highest inspection standards of U. S. Army Corps of Engineers and the S. Morgan Smith Company.**

If your product requires nonferrous components, why not investigate our facilities and abilities. Write to National Bearing Division for information.



AMERICAN Brake Shoe COMPANY

NATIONAL BEARING DIVISION

4930 Manchester Avenue, St. Louis 10, Mo.

***Plants in:* St. Louis, Mo. • Meadville, Pa. • Niles, Ohio • Portsmouth, Va. • St. Paul, Minn. • Chicago, Ill.**

(*Concluded from page 154*)

REINFORCING BARS PENDING

691 tons, bridge work, Garden State parkway, contract No. 173, section 11, Atlantic county, New Jersey, with 216 tons depending on type of construction; bids to be opened by New Jersey Highway Authority, Trenton, N. J., Oct. 14.

460 tons, bridges, LaPorte county, Indiana toll road, contracts C-22 and C-23; bids Oct. 6 to Indianapolis.

325 tons, bridge substructure, route 200, project 3459, Greys Point, Lancaster-Middlesex, Va., contract No. 1; bids Oct. 11, Department of Highways, Richmond, Va.

110 tons, two Idaho state bridges, Blaine county; bids to Boise, Idaho, Oct. 12.

100 tons plus, department store and parking structure for Meier & Frank Co., Salem, Oreg.; general contract to Viesko & Post, Salem, and Hoffman Construction Co., Portland, Oreg.

100 tons, warehouse, Ft. Richardson, Alaska; general contract by U. S. Engineer to Lease & Leigland and M. B. Contracting Co., Seattle, at $266,910.

100 tons plus, two 200-man barracks, Ladd Air Base, Alaska; S. S. Mullen Inc., Seattle, low at $1,161,930.

PLATES . . .

PLATES PLACED

915 tons, gas holder, Public Service Electric & Gas Co., Newark, N. J., to Stacey Mfg. Co., Cincinnati.

100 tons, also shapes, 180-ft., 1200-ton capacity grain barge for River Line, Sacramento, Calif., to Albina Engine & Machine Works, Portland, Oreg.

PLATES PENDING

3200 tons, 70 bolted tanks, Corps of Army Engineers, Philadelphia; bids Oct. 13.

2590 tons, hull, Navy, General Stores Supply Office, Philadelphia, Oct. 4.

1000 tons, medium tensile hull, Navy Purchasing Office, Washington, Oct. 6, various deliveries.

535 tons, armor, Navy Purchasing Office, Washington, Oct. 5.

405 tons, high tensile hull, Navy Purchasing Office, Washington, Oct. 6 delivery to Kearny, N. J.

225 tons, high tensile hull, Navy Purchasing Office, Washington, Oct. 4.

150 tons, 500,000-gal. elevated water tank, naval auxiliary air station, Kingsville, Tex.; bids Oct. 7, Naval Air Station, Corpus Christi, Tex.

PIPE . . .

CAST IRON PIPE PLACED

300 tons, 12-in., local improvement district, Tacoma, Wash., to Pacific States Cast Iron Pipe Co., Seattle.

160 tons, Hermiston, Oreg.; also 32 tons, Camas, Wash., to Pacific States Cast Iron Pipe Co., Seattle.

110 tons, flight center, Larson Air Field, Washington state, to Pacific States Cast Iron Pipe Co., Seattle.

100 tons, District No. 49, Seattle, to U. S. Pipe & Foundry Co., Seattle.

CAST IRON PIPE PENDING

100 tons plus, 1865 feet of 16-in.; bids to Renton, Wash., Oct. 5.

STEEL PIPE PLACED

315 tons, 42 and 48-in. pipe, Erie Mining Co., Taconite Harbor, Minn., to Bethlehem Steel Co., Bethlehem, Pa.

RAILS, CARS . . .

LOCOMOTIVES PENDING

Milwaukee, 74 diesel units; purchase authorized.

RAILROAD CARS PLACED

Cotton Belt, 275 fifty-ton box cars to the Pullman-Standard Car Mfg. Co., Chicago.

Rock Island, 25 baggage cars to ACF Industries Inc., New York.

RAILROAD CARS PENDING

Santa Fe, 1300 freight cars, bids asked; list referred to in a previous issue comprises 500 seventy-ton drop-end gondolas, 250 fifty-ton flat cars, 150 seventy-ton mill-type gondolas, 300 fifty-ton refrigerator cars and 100 fifty-ton box cars.

Ores

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	20.00
N. African hematite (spot)	nom. 20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, good commercial quality	$24.00-25.00
Domestic sheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 90c-92c per long ton unit c.i.f. U. S. ports, duty for buyer's account: 46-47%, 80c-83c.

Chrome Ore

Gross ton f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$42.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	nom. 34.00

Domestic

(Rail nearest seller)

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb, Mo content mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$3.80-$4.20
60-65%	4.65-4.75

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill. Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, Niles, O., Hays, Pa., $120; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° *F:* Massillion, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Maxico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala. $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Jonhstown, Merrill Station, Pa., Wellsville, O., $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-$15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, deld.	28.12
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.00
Swedeland, Pa., ovens	23.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, O. deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

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*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

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†With port equalization against imports.

Cents per pound, producing point

Phenol 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32-$33; 60%, $28-$29. Imported, net ton, duty paid, metallurgical grade: European, $28-30; Mexican, $25.50.

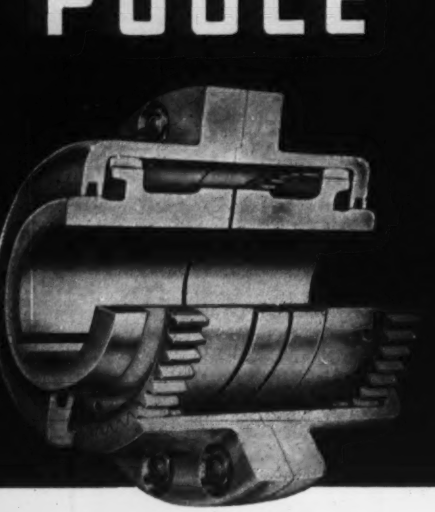
Electrodes

(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Inches		Per 100 lb
Diam.	Length	
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00
CARBON		
40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

POOLE



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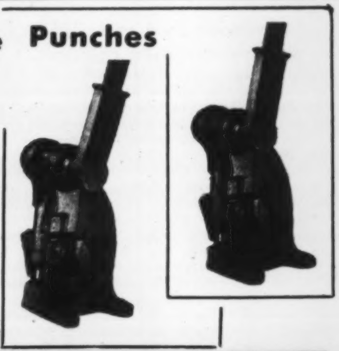

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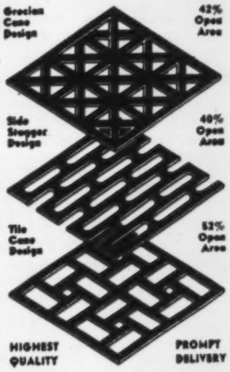

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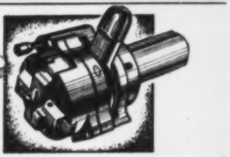

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- Specialty Work Invited

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Scrap . . .

Scrap Prices, Page 160

Boston—Turnings are moving in heavier volume and with other grades of steel scrap are selling at slightly higher levels. Heavy melting steel grades are higher for both domestic account and export. No. 2 heavy melting and bundles are developing a stronger trend. Dealers are paying up to $14, yard, for unprepared steel. Cast scrap is also firmer.

New York—The scrap export market is boiling. Brokers' buying prices have advanced sharply on No. 1 heavy melting and No. 1 bundles to $25, and on No. 2 heavy melting to $23. No. 2 bundles are slightly higher at $18.

Buying for foreign shipment eclipses domestic trading. Largely in sympathy with higher prices on major open hearth grades, brokers advanced prices on low phos scrap to a range of $28 to $29. Other grades are unchanged.

Between 80,000 and 100,000 tons of scrap have been exported from here within the past six weeks.

Buffalo—A decidedly stronger tone prevails in the local scrap market with local steel production up 5 points. Dealers are reluctant to pay attention to bids within recently quoted ranges. Supply has decreased. Better prices, however, are attracting boat receipts. Four freighters with about 15,000 tons arrived from upper lake points last week. Pig iron production in the district has been increased 6 points as the leading mill relighted one blast furnace idle since June.

Philadelphia—Steel mills continue to show more interest in scrap. This, combined with strong demand from abroad, has resulted in an advance in No. 1 heavy melting steel and No. 1 bundles to a flat $29, delivered, and an increase in No. 2 heavy melting to $27. Electric furnace bundles also are higher on recent buying at $30, delivered. Other grades are unchanged.

Last week two shipments of steel scrap were loaded here for export, bringing the total for the past two months close to 50,000 tons for this port alone.

Pittsburgh—New buying is at a standstill. No. 1 steelmaking scrap is still $30 to $31, although it is believed new buying would boost the price $1. U. S. Steel Corp. is expected to come into the market, momentarily.

Some minor buying of No. 1 railroad heavy melting and railroad specialties raised those grades $1 a ton. The former is now $33 to $34 and the latter, $35 to $36.

No Pittsburgh scrap is moving eastward to the export market, but exports of seaboard scrap are restricting the tonnage available for movement into the Pittsburgh market. This acts as a support to Pittsburgh prices.

Cleveland—Rising steelmaking operations are being reflected in returning strength to the scrap market. Sentiment is definitely bullish, though mill buying has not assumed sizable proportions. The better market tone is especially noticeable in blast furnace grades, with prices rising about $1 last week. The railroad and foundry grades also are stronger and quoted higher.

Cincinnati — General strength is evident in the market as brisk bidding continues on industrial lists. Mill buying prices are expected to advance. Brokers predict local prices will increase at least $1 a ton in October.

Chicago—The scrap market here is gaining strength out of proportion with demand or improvement in the steelmaking rate. The latter has picked up only 2.5 points in the past month and mills are buying scrap sparingly.

Small purchases have established heavy melting at $2 a ton higher with corresponding boosts in blast furnace and foundry grades. Some railroad grades have jumped even more.

St. Louis—Scrap has a stronger undertone, accompanied by minor and selective price increases. Dealers predict a gradual rise over weeks ahead.

Los Angeles — Some dealers are cautiously predicting that fourth quarter will be the best period of the year in the scrap market.

San Francisco—Demand for cast grades continues strong. Prices for steel scrap are unchanged.

Seattle—Steel and cast scrap prices are firm.

OK

T-slot Bolts

The world's best . . . one-piece, drop forged—not welded—of mild carbon steel, heat-treated, with head accurately milled for standard tables on lathes, planers, boring mills, milling machines. Integral washer and nut. Sizes: up to 30". Typical direct prices for 10" lengths: ½—$1.36; ⅝—$1.36; ¾—$1.58; ⅞—$1.89. Write for price list.

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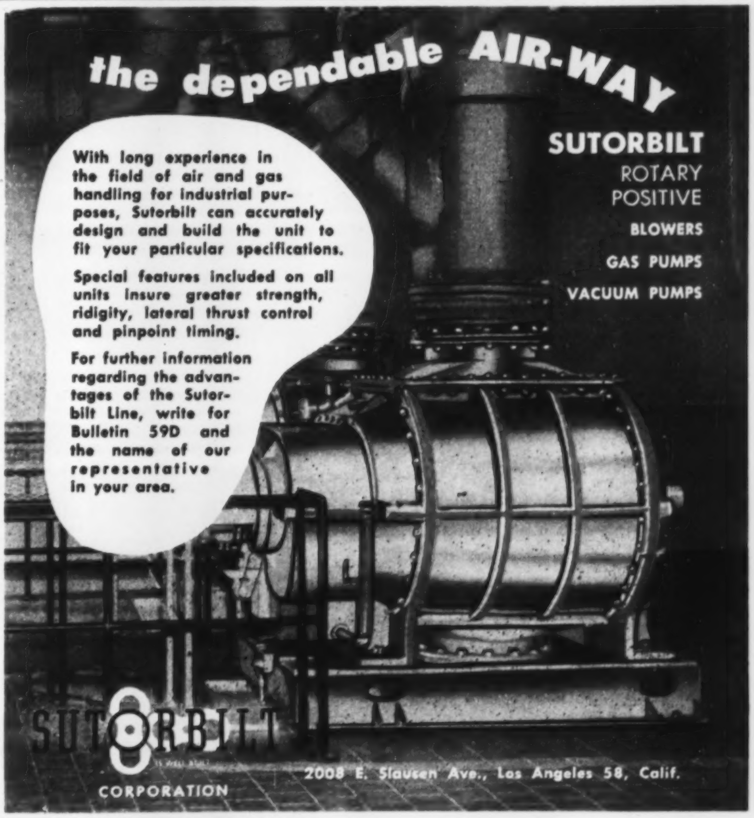
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SUTORBILT CORPORATION

2008 E. Slausen Ave., Los Angeles 58, Calif.

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

COMPOSITE STEELMAKING SCRAP

Sept. 29	$30.50
Sept. 22	29.75
Aug. Avg.	28.80
Sept., 1953	36.93
Sept. 1949	26.07

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	27.00-28.00
No. 1 bundles	30.00-31.00
No. 2 bundles	24.00-25.00
No. 1 busheling	29.00-30.00
Machine shop turnings	16.00-17.00
Mixed borings, turnings	16.00-17.00
Short shovel turnings	19.00-20.00
Cast iron borings	18.00-19.00
Cut structurals, 5 ft lengths	32.00-33.00
Heavy turnings	26.00-27.00
Punchings & plate scrap	33.00-34.00
Electric furnace bundles	32.00-33.00

Cast Iron Grades

No. 1 cupola	37.00-38.00
Charging box cast	32.00-33.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	23.00-24.00
No. 1 machinery cast	42.00-43.00

Railroad Scrap *

No. 1 R.R. heavy melt.	*33.00-34.00*
Rails, 2-ft and under	43.00-44.00
Rails, 18-in. and under	44.00-45.00
Rails, random lengths	37.00-38.00
Railroad specialties	*35.00-36.00*

Stainless Steel Scrap

18-8 bundles & solids	180.00-190.00
18-8 turnings	85.00-90.00
430 bundles & solids	65.00-70.00
430 turnings	50.00-52.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	*28.00-29.00*
No. 1 bundles	30.00-31.00
No. 2 bundles	*25.00-26.00*
No. 1 busheling	30.00-31.00
Machine shop turnings	*15.00-16.00*
Mixed borings, turnings	*18.00-19.00*
Short shovel turnings	*18.00-19.00*
Cast iron borings	*18.00-19.00*
Low phos.	*32.00-33.00*
Cut structural plate 2 ft and under	*36.00-37.00*
Alloy free, short shovel turnings	*20.00-21.00*
Electric furnace bundles	30.00-31.00

Cast Iron Grades

No. 1 cupola	*42.00-43.00*
Charging box cast	*27.50-28.50*
Stove plate	*34.00-35.00*
Heavy breakable cast	*26.50-27.50*
Unstripped motor blocks	25.00-26.00
Brake shoes	*30.00-31.00*
Clean auto cast	*44.00-45.00*
No. 1 wheels	*36.00-37.00*
Burnt cast	*28.00-29.00*
Drop broken machinery	*43.00-44.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*32.00-33.00*
R.R. malleable	*43.00-44.00*
Rails, 3-ft and under	*45.00-46.00*
Rails, 18 in. and under	*47.00-48.00*
Rails, random lengths	*42.00-43.00*
Cast steel	*36.00-37.00*
Railroad specialties	*36.00-37.00*
Uncut tires	*37.00-38.00*
Angles, splice bars	*42.00-43.00*
Rails, rerolling	*50.00-51.00*

Stainless Steel

(F.o.b. shipping point)

18-8 bundles, solids	nom. 160.00-170.00
18-8 turnings	nom. 70.00-80.00
480 clips, bundles, solids	nom. 70.00
480 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	27.00-28.00
No. 1 bundles	32.00-33.00
No. 2 bundles	23.00-24.00
Machine shop turnings	*14.00-15.00*
Short shovel turnings	*20.00-21.00*
Cast iron borings	*20.00-21.00*
Low phos.	*34.00-35.00*
Electric furnace bundles	*32.00-33.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*33.00-34.00*

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	*29.00*
No. 2 heavy melting	*27.00*
No. 1 bundles	*29.00*
No. 2 bundles	23.00
No. 1 busheling	28.50-29.00*
Electric furnace bundles	*30.00*
Machine shop turnings	16.00-16.50
Mixed borings, turnings	19.00
Short shovel turnings	20.00
Structurals & plate	30.00-31.00
Heavy turnings	27.00*
Couplers, springs, wheels	32.00-33.00
Rail crops, 2 ft & under	42.00-43.00

Cast Iron Grades

No. 1 cupola	35.00-36.00
Malleable	37.00*
Heavy breakable cast	35.50
Unstripped motor blocks	nom.
Drop broken machinery	41.00-42.00

*Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*25.00*
No. 2 heavy melting	*23.00*
No. 1 bundles	*25.00*
No. 2 bundles	*18.00*
Machine shop turnings	8.00-8.50
Mixed borings, short turnings	11.00-12.00
Low phos. (structural & plate)	*28.00-29.00*
Short shovel turnings	11.00-12.00

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	19.00-20.00*

Stainless Steel

18-8 sheets, clips, solids	170.00-175.00
18-8 borings, turnings	70.00-75.00
430 sheets, clips, solids	40.00
410 sheets, clips, solids	30.00

*Nominal.

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*20.00*
No. 2 heavy melting	*16.00-17.00*
No. 1 bundles	*20.00*
No. 2 bundles	*15.00-15.50*
Mixed borings, turnings	*9.50-10.50*
Machine shop turnings	*5.50-6.00*
Short shovel turnings	*10.50-11.50*
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	32.00-33.00

* $4 to $4.50 higher for export.

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	25.50-26.50
No. 2 heavy melting	22.50-23.50
No. 1 bundles	25.50-26.50
No. 2 bundles	19.00-20.00
No. 1 busheling	25.50-26.50
Machine shop turnings	11.00-12.00
Mixed borings, turnings	14.50-15.50
Short shovel turnings	14.50-15.50
Cast iron borings	14.50-15.50
Low phos. 18-in.	33.00-34.00

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable cast	35.00
Charging box cast	36.00
Drop broken machinery	44.00

Railroad Scrap

No. 1 R.R. heavy melt	31.00-32.00
Rails, 18-in. and under	44.00-45.00
Rails, random lengths	36.00-37.00

CHICAGO

No. 1 heavy melting	*31.00-33.00*
No. 2 heavy melting	28.00-29.00
No. 1 factory bundles	*33.00-34.00*
No. 1 dealer bundles	*30.00-31.00*
No. 2 bundles	22.00-23.00
No. 1 busheling	*31.00-33.00*
Machine shop turnings	*15.00-16.00*
Mixed borings, turnings	*17.00-18.00*
Short shovel turnings	*17.00-18.00*
Cast iron borings	*17.00-18.00*
Cut structurals, 3-ft	*33.00-34.00*
Punchings & plate scrap	*34.00-35.00*
Electric furnace bundles	*34.00-35.00*

Cast Iron Grades

No. 1 cupola	*38.00-39.00*
Stove plate	*31.00-32.00*
Unstripped motor blocks	*25.00-26.00*
Clean auto cast	*41.00-42.00*
Drop broken machinery	*41.0042.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*34.00-35.00*
R.R. malleable	**40.00-42.00**
Rails, 2-ft and under	*48.00-49.00*
Rails, 18-in. and under	*49.00-50.00*
Angles, splice bars	*42.00-43.00*
Rails, rerolling	*50.00-53.00*

Stainless Steel Scrap

18-8 clips & solids	130.00-140.00
18-8 turnings	60.00
430 clips & solids	40.00
430 turnings	20.00-25.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*24.00*
No. 2 heavy melting	*20.50*
No. 1 bundles	*25.00*
No. 2 bundles	*19.00*
No. 1 busheling	*24.00*
Machine shop turnings	*11.00*
Mixed borings, turnings	*11.00*
Short shovel turnings	*15.00*
Punchings & plate scrap	*26.00*

Cast Iron Grades

No. 1 cupola	33.00
Charging box cast	27.00
Stove plate	29.00
Heavy breakable	23.00
Unstripped motor blocks	18.00
Clean auto cast	37.00
Malleable	28.00

BUFFALO

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	22.50-23.50
No. 1 bundles	28.00-29.00
No. 2 bundles	20.50-21.50
No. 1 busheling	28.00-29.00
Machine shop turnings	13.50-14.50
Mixed borings, turnings	17.00-17.50
Short shovel turnings	18.00-18.50
Cast iron borings	17.00-17.50
Low phos.	30.50-31.50

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	35.00-36.00
No. 1 machinery	39.00-40.00

Railroad Scrap

Rails, random lengths	33.00-34.00
Rails, 3 ft and under	40.00-41.00
Railroad specialties	34.50-35.50

BIRMINGHAM

No. 1 heavy melting	23.00-24.00
No. 2 heavy melting	21.00-22.00
No. 1 bundles	18.00-19.00
No. 2 bundles	21.00-22.00
Cast iron borings	*16.00-17.00*
Short shovel turnings	16.00-17.00
Machine shop turnings	15.00-16.00
Electric furnace bundles	28.00-29.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate	30.50-31.50
Structural plate, 2 ft	30.50-31.50
Unstripped motor blocks	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	28.00-29.00
Rails, 18-in. and under	39.00-40.00
Rails, rerolling	*40.00-41.00*
Angles, splice bars	*37.50-38.50*
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	26.50
No. 2 heavy melting	24.50
No. 1 bundles	26.50
No. 2 bundles	*21.50*
Machine shop turnings	14.00
Short shovel turnings	16.00

Cast Iron Grades

No. 1 cupola	38.00
Charging box cast	29.00
Heavy breakable cast	29.00
Unstripped motor blocks	29.00
Brake shoes	30.00
Clean auto cast	40.00
Stove plate	33.00

Railroad Scrap

No. 1 R.R. heavy melt.	*34.00*
Rails, 18-in. and under	*44.00*
Rails, random lengths	*40.50*
Rails, rerolling	49.00
Angles, splice bars	35.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	25.00
No. 2 heavy melting	21.00
No. 1 bundles	21.00
No. 2 bundles	17.00
No. 3 bundles	13.00
Machine shop turnings	11.50
Mixed borings, turnings	11.50
Short shovel turnings	11.50
Electric furnace, No. 1	32.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	34.00-35.00
Heavy breakable cast	23.00
Unstripped motor blocks	23.00
No. 1 wheels	21.00
Stove plate(f.o.b. plant)	28.00
Brake shoes	28.00

Railroad Scrap

(Delivered consumer plant)

Rails, random lengths	30.00-34.00

LOS ANGELES

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	20.00
No. 2 bundles	16.00
Machine shop turnings	5.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 1 busheling	20.00
Machine shop turnings	5.00
Mixed borings, turnings	5.00
Short shovel turnings	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	43.00-46.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting	$22.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	17.00
Mixed steel scrap	16.00
Mixed borings, turnings	12.00
Rails, remelting	32.00
Busheling, new factory:	
Prepared	20.00
Unprepared	16.00
Short steel turnings	12.00

Cast Iron Grades†

No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.

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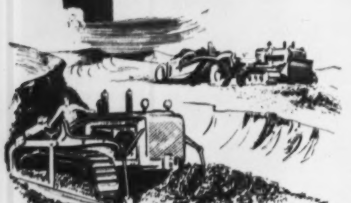

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Semifinished Steel . . .

Semifinished Prices, Page 140

Ingot operations in the Chicago district, at 69.5 per cent of capacity, are at the highest level since the closing week of July when the same rate prevailed.

Youngstown Sheet & Tube Co. this week is starting production at its idle Brier Hill Works in Youngstown.

Sharon Steel Corp. shut down its Lowellville blast furnace and open hearths late last week for two weeks to make major repairs. These include replacing a soaking pit crane, motor repair and other work. About 1000 workers are affected.

Substantial pickup in steel orders is reported by Henry A. Roemer Jr., president. The company's order department is "quite optimistic". Customers have exhausted inventories, he says. One user, who has not purchased since last March, placed an order for 1000 tons last week.

Mr. Roemer expects good demand to develop when new auto models get into production. Competent economists are predicting tight steel supply by late 1954, he says.

Ferroalloy Prices

FERROALLOY quotations remain unchanged. The current price schedule was published in full on page 140 of the Sept. 27 issue of STEEL.

Plates . . .

Plate Prices, Page 140

Carbon plate business shows little gain, but producers are not worrying about large consumer inventories. Virtually all orders coming through are for rush shipment, indicating that users are depending on prompt deliveries rather than stocks.

As a general thing, the mills can give shipments within a week to 10 days.

Exceptions to this short order business involve Navy requirements. Actually, Navy work is proving quite a help to some eastern district plate mills. No little Navy tonnage, it is reported, is being sent first to the Navy's plant at Kearny, N. J., for pickling and oiling.

Demand for fuel oil storage tanks for domestic and light industrial applications is showing seasonal improvement. But pressure vessel sales are off, and oil companies are not measuring up to anticipated needs.

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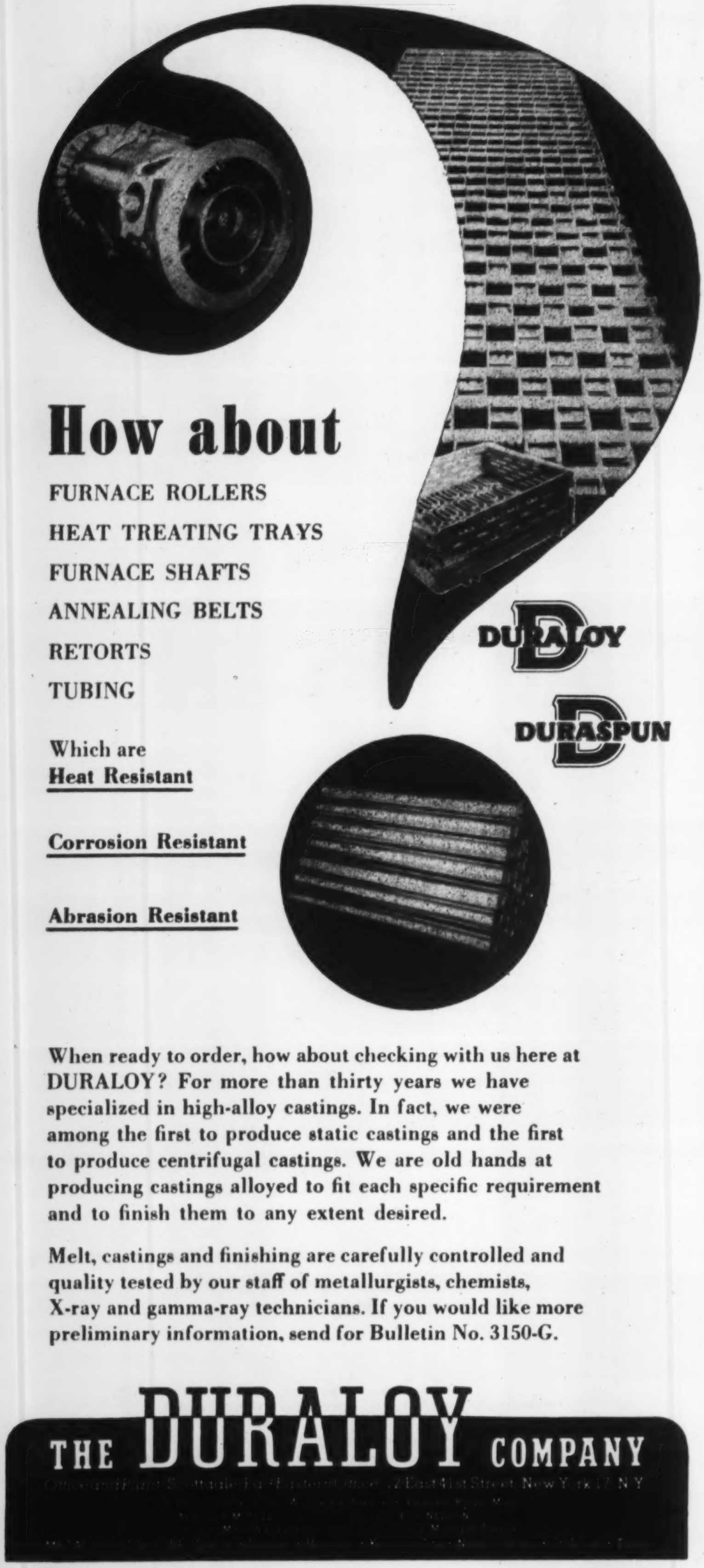

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[illegible]

Pig Iron . . .

Pig Iron Prices, Page 145

Pig iron sellers are not as optimistic about prospects for October business as they were. They continue to await the pick-up reflecting the automotive run of new models. There was a slight improvement in September and this trend may gain momemtum.

Iron Ore . . .

Iron Ore Prices, Page 154

Lake ore shipments were 1,806,688 gross tons in the week ended Sept. 27, reports the Lake Superior Iron Ore Association. This compares with 3,040,335 tons in the same week of 1953. Cumulative shipments to Sept. 27 in the 1954 shipping season were reported at 49,690,955 tons.

Warehouse . . .

Warehouse Prices, Page 145

The national "steel-on-hand" problem has a two-pronged effect on most distributors. Not only are warehouse inventories high but some mills are using price advantages to lure back warehouse business and reduce their own swollen stocks. Warehouse sales of structurals and plates are retarded by small-lot bookings by mills.

Prices are softening on more carbon products. While some distributors are holding the line, they are losing some volume on a price basis.

Wire . . .

Wire Prices, Pages 142 & 143

Heavier buying by the automotive industry paces moderate improvement in wire order volume.

Welded wire fabric is finding increasing use for reinforcing asphalt paving. It is being used in repair of 22 miles of the Pennsylvania turnpike.

Tubular Goods . . .

Tubular Goods Prices, Page 144

Demand for oil country goods continues outstanding. Producers of pipe for oil and gas lines are booked into December on most sizes.

Some consumers, however, are reducing inventories, and to do so, are shifting pipe among areas.

Programs for new pipelines are still coming out, brightening prospects for continued strong demand for pipe into next year. Reflecting the prevailing optimism in the market, Youngstown Sheet & Tube Co. is starting up production at its idle Brier Hill Works. A force of 500 men will rebuild its No. 2 seamless mill.

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Your best
cancer insurance...

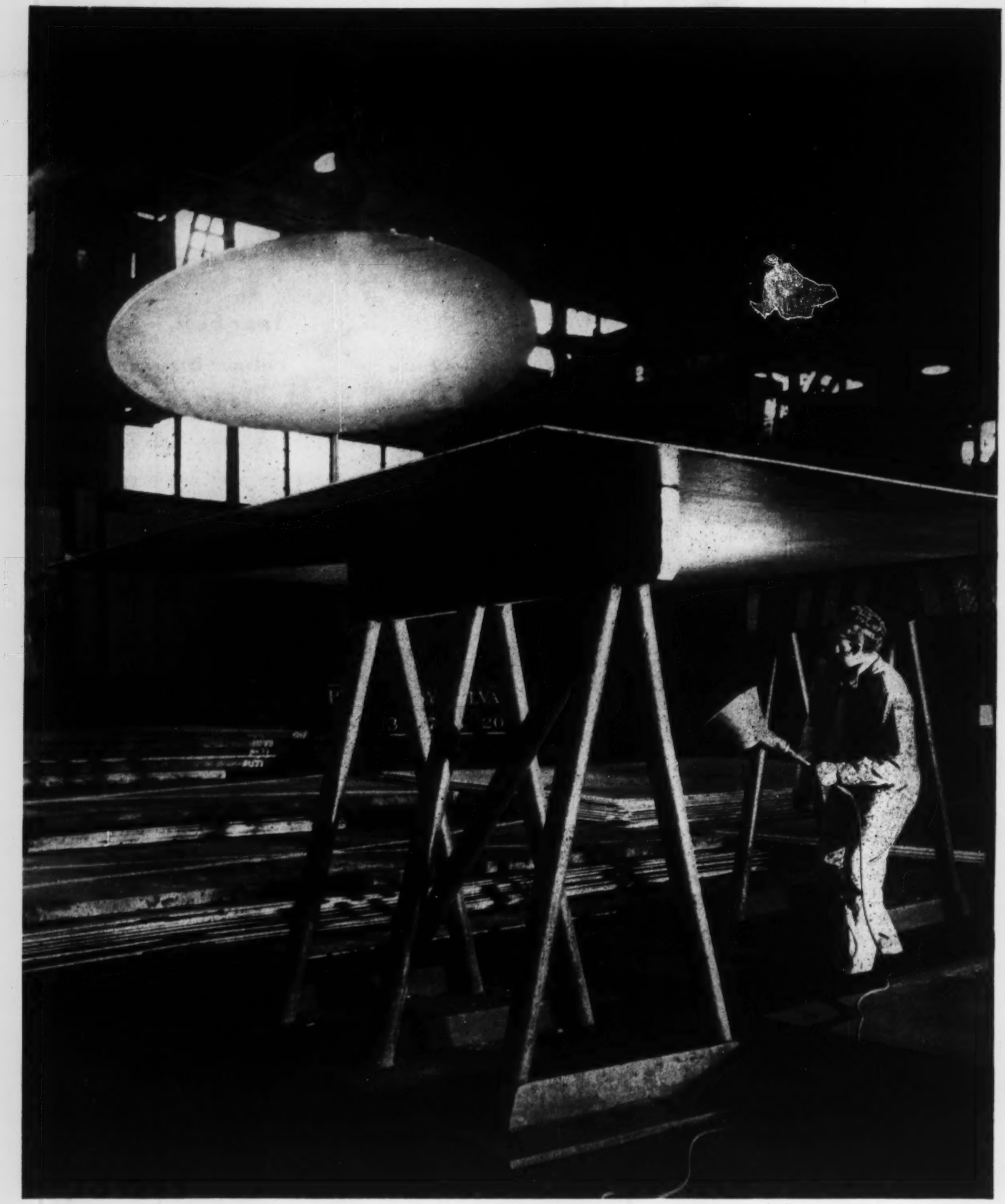
"LIFETIME" POLICY... See your doctor *every year* for a thorough check-up, no matter how well you feel.

"DAY-TO-DAY" POLICY ...See your doctor *immediately* at the first sign of any one of the seven danger signals that *may* mean cancer (1) Any sore that does not heal (2) A lump or thickening in the breast or elsewhere (3) Unusual bleeding or discharge (4) Any change in a wart or mole (5) Persistent indigestion or difficulty in swallowing (6) Persistent hoarseness or cough (7) Any change in normal bowel habits.

Many cancers can be cured, but only if properly treated *before* they have begun to spread or "colonize" in other parts of the body.

For *any* information about cancer just call the American Cancer Society or write to "Cancer" in care of your local Post Office.

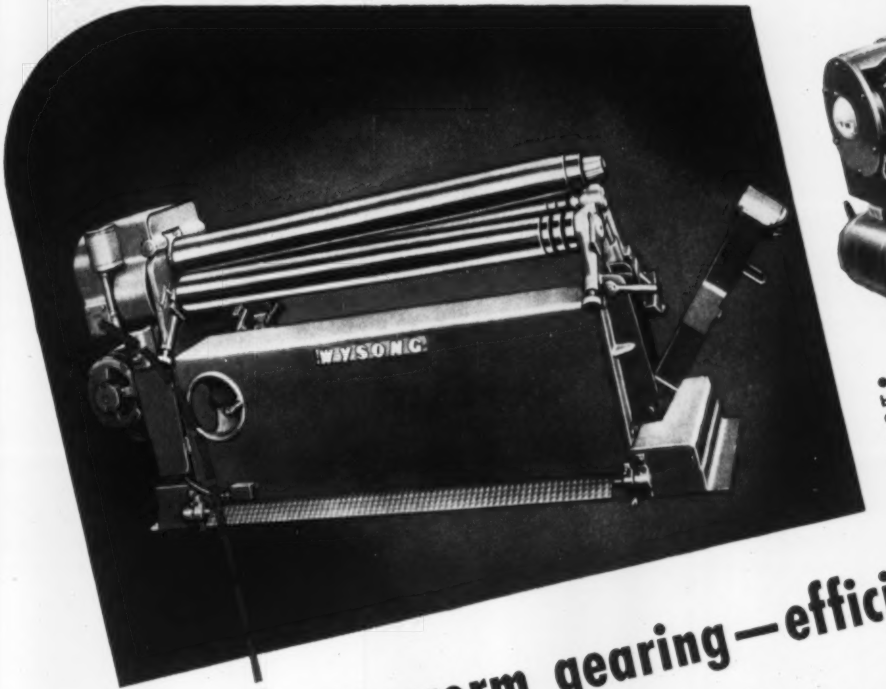
American
Cancer
Society

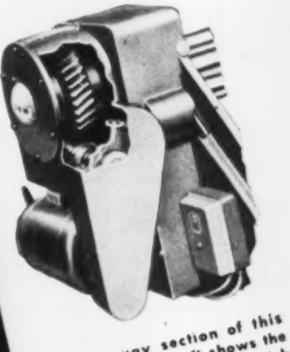


STEEL PLATES FOR EVERY REQUIREMENT Bethlehem produces a full line of sheared and universal plates, in a complete size range. Bethlehem Plates come in these nine types: Structural, Flange, Firebox, Forging, Abrasive-Resisting, Mayari R (high-strength, low-alloy), Medium-Manganese, Alloy, and Marine. For complete information about any of these types of Bethlehem Plates, please get in touch with the Bethlehem office nearest you.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation





● Cutaway section of this bending roll at left shows the Cleveland worm gearing which drives the rolls that form steel sheets into cylinders.

Illustration courtesy of Wysong and Miles Company.

CLEVELAND worm gearing—efficient for life

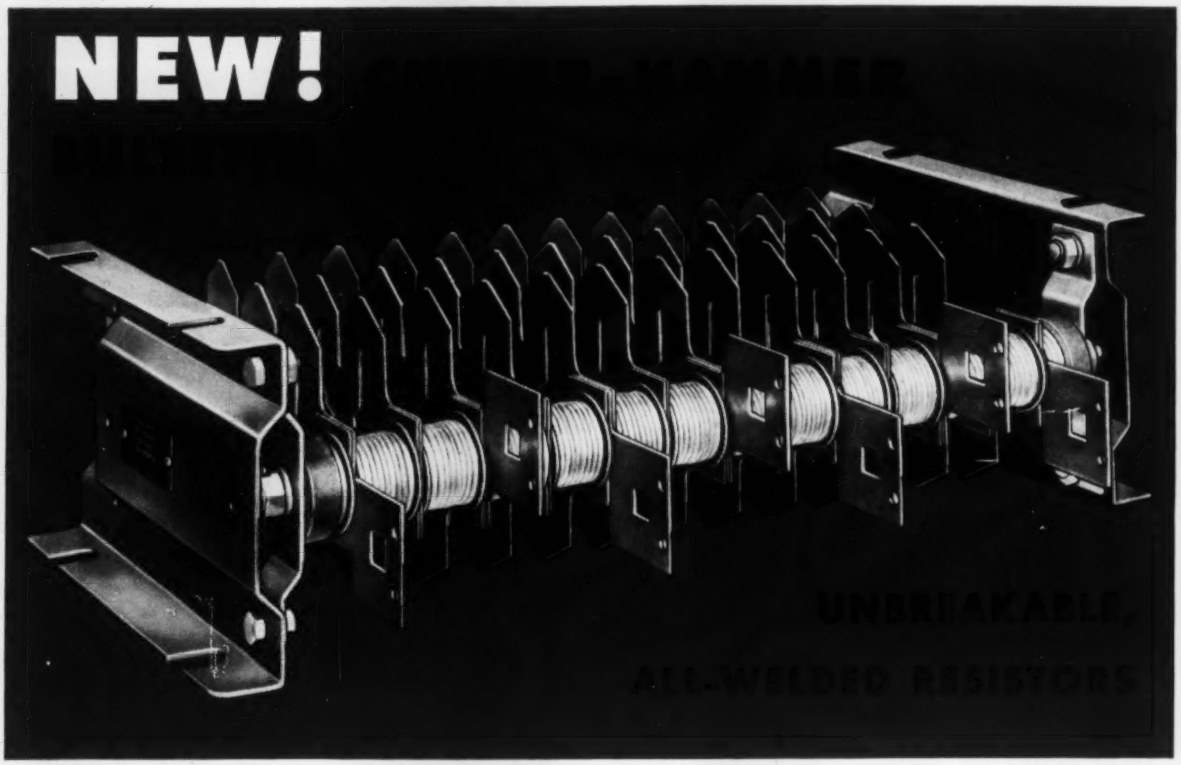
INSIDE this new Wysong 5″ Bending Roll, Cleveland worm gearing drives the rolls that form steel sheets into cylinders. And although gear life will be a series of split-second starts and stops under load, it will operate dependably *for years* because Cleveland worm gearing never loses its efficiency!

That's because Cleveland worms and gears are perfectly made during manufacture to run together smoothly. Rate of wear of the worm is negligible with the wear *localized* on the nickel-bronze gear. Thus, thread contours on the case-hardened steel worm remain *unchanged for life.* This means that Cleveland worm gearing in a machine will have the *same* high efficiency ten, twenty or thirty years from today as it has now.

So look to the name *Cleveland,* when you want worm gearing that will last. It's a name backed by 42 years of *exclusive* manufacture of worms and gears. Get full engineering data on Cleveland worm gearing and our complete speed reducer line by writing for free Catalog 400. The Cleveland Worm and Gear Company, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Drives



Lower Maintenance Costs, More Stable Resistance Values, Higher Current Capacities

Cutler-Hammer now offers a brand-new unbreakable mill-type resistor with design features that provide an all-welded current path, that stabilize resistance values, afford high current capacities, and resist corrosion and vibration.

The individual grids are punched from a chromium steel alloy and are mounted in an unique over-under arrangement to attain exceptionally efficient heat radiation which permits continuous current capacities up to 180 amperes per box. The low resistance coefficient of the grid alloy results in small resistance change despite grid temperature variation. Grid junctions are seam welded and terminal taps spot welded to insure a continuous current path and to eliminate grid contact troubles. Rugged steel and mica washers are used as grid spacers and insulators.

A radically new type of end plate and grid rod design affords "draw-out" replacement of the grid assembly without disturbing the end plates or other boxes in the resistor stack. This exclusive construction feature also compensates for thermal expansion of the individual grids.

These resistors are available in ratings from 1/10th to 10 ohms. Standard boxes come in 17", 22½" and 28" lengths. Terminals provide 10% resistance steps. All resistors are insulated for 600 volt service.

For lower maintenance costs, more stable resistance values, and higher current capacities *standardize on these new Cutler-Hammer Bulletin 11011 Unbreakable Resistors.* CUTLER-HAMMER, Inc., 1211 St. Paul Avenue, Milwaukee 1, Wisconsin. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto, Ontario.

CUTLER-HAMMER
MOTOR CONTROL
C-H